SLV-E1000AS/B/NP/NZ/UX/VC
RMT-V174/V174A/V174B/V174C

SERVICE MANUAL

AEP Model
SLV-E1000VC
UK Model
SLV-E1000UX
Spanish Model
North European Model
SLV-E1000NP
French Model
SLV-E1000B
Australian Model
SLV-E1000AS
Newzealand Model
SLV-E1000NZ

(Photo : SLV-E1000NP/RMT-V174)

Remote commander is available as a unit. See page 5-1 for repair parts.

VHS PAL Hi-Fi

H MECHANISM

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT IV (H MECHA) for MECHANICAL ADJUSTMENTS. (9-973-623-11)**

SPECIFICATIONS

System

Channel coverage
PAL:
UHF B21 – B69

RF output signal
UHF channels 28 – 55

Aerial out
75-ohm asymmetrical aerial socket

Inputs and outputs

⇔EURO-AV (LINE1)
21-pin
Video input: pin 20
Audio input: pins 2 and 6
Video output: pin 19
Audio output: pins 1 and 3

⇒EURO-AV (LINE IN 3)
21-pin
Video input: pin 20
Audio input: pins 2 and 6

LINE IN 2
LINE IN 4
VIDEO IN, Phono jack (1)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, Phono jack (2)
Input level: 327 mVrms
Input impedance: more than 47 kilohms

LINE OUT 2
VIDEO OUT, Phono jack (1)
Output signal: 1 Vp-p, 75 ohms (unbalanced), sync negative
AUDIO OUT, Phono jack (2)
Rated output level: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

MIC (PLUG IN POWER)
Minijack (1), 0.775 mVrms, for low impedance microphone

PHONES
Stereo minijack (1), 38.8 mVrms, 8 ohms

LANC
Stereo mini-minijack

General

Power requirements
220 – 240 V AC, 50 Hz

Power consumption
27 W

Operating temperature
5°C to 40°C

Storage temperature
–20°C to 60°C

Dimensions
Approx. 430 × 103 ×319 mm (w/h/d)
including projecting parts and controls

Mass
Approx. 5.3 kg

—continued on next page—

VIDEO CASSETTE RECORDER

SONY®

MICROFILM

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
Mains lead (1)
Audio/video cable (1)
LANC cable (1)

Design and specifications are subject to change without notice.

The remote commander used for each model is as follows.

- RMT-V174 : SLV-E1000NP/VC
- RMT-V174A : SLV-E1000B
- RMT-V174B : SLV-E1000UX
- RMT-V174C : SLV-E1000AS/NZ

DESTINATION DIFFERENCE SCHEMATIC COMPONENT TABLE LIST

This manual are for the SLV-E1000AS/B/NP/NZ/UX/VC. Check model number by locking at the rear panel of VCR.

MODEL / FEATURE	AS (Australian)	B (French)	NP (North European, Spanish)	NZ (Newzealand)	VC (AEP)	UX (UK)
MA-241 BOARD (Recording/Playing broadcast systems)	B/G	B/G L NICAM	B/G NICAM	B/G NICAM	B/G	I NICAM
CP-71 BOARD Recording Canal+/PAY—TY programmes	(O)	O	O	(O)	O	—
RV-44 BOARD (Recording /Playing SECAM	—	O	—	—	—	—
Recording TV programmes (G-CODE/SHOW VIEW/VIDEO Plus+)	G-CODE	SHOW VIEW	SHOW VIEW	G-CODE	SHOW VIEW	VIDEO Plus+

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
Mains lead (1)
Audio/video cable (1)
LANC cable (1)

Design and specifications are subject to change without notice.

The remote commander used for each model is as follows.

- RMT-V174 : SLV-E1000NP/VC
- RMT-V174A : SLV-E1000B
- RMT-V174B : SLV-E1000UX
- RMT-V174C : SLV-E1000AS/NZ

DESTINATION DIFFERENCE SCHEMATIC COMPONENT TABLE LIST

This manual are for the SLV-E1000AS/B/NP/NZ/UX/VC. Check model number by locking at the rear panel of VCR.

MODEL / FEATURE	AS (Australian)	B (French)	NP (North European, Spanish)	NZ (Newzealand)	VC (AEP)	UX (UK)
MA-241 BOARD (Recording/Playing broadcast systems)	B/G	B/G L NICAM	B/G NICAM	B/G NICAM	B/G	I NICAM
CP-71 BOARD Recording Canal+/PAY—TY programmes	(○)	○	○	(○)	○	—
RV-44 BOARD (Recording /Playing SECAM	—	○	—	—	—	—
Recording TV programmes (G-CODE/SHOW VIEW/VIDEO Plus+)	G-CODE	SHOW VIEW	SHOW VIEW	G-CODE	SHOW VIEW	VIDEO Plus+

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

Section *Title* *Page*

SERVICE NOTE

1. Removal of Drum Assembly 5
2. Upper Drum Replacement 5
  2-1. Removal of Upper Drum 5
  2-2. Mounting Upper Drum 5
3. Periodic Check and Replacement 6
  3-1. Cleaning of Rotating Head Disk Assembly 6
  3-2. Cleaning of the Tape Movement System 6
  3-3. Cleaning the Drive System 6

1. GENERAL

- Index to parts and controls 1-1
- Welcome/ 1-3
- Step 1 : Unpacking 1-4
- Step 2 : Connecting the VCR 1-4
- Step 3 : Setting up the remote commander 1-5
- Step 4 : Tuning the TV to your VCR 1-7
- Step 5 : Setting up the VCR sequentially (EASY SET UP) 1-7
- Step 6 : Setting the clock on the remote commander ..1-9
- Selecting a language manually 1-9
- Setting the clock manually 1-10
- Tuning the VCR to TV channels manually 1-11
- Setting up VIDEO Plus+ manually 1-12
- Changing the programme positions of the stations ..1-13
- Playing a tape 1-13
- Setting the Canal Plus/PAY-TV decoder 1-15
- Recording TV programmes 1-16
- Recording TV programmes using the timer 1-18
- Recording TV programmes using VIDEO Plus+ 1-20
- Checking/changing/cancelling timer settings 1-21
- Additional instructions about timer recording 1-22
- Playing/searching at various speeds 1-22
- Adjusting the picture 1-23
- Searching using the index function 1-24
- Looking at menu options 1-24
- Editing methods 1-25
- Hooking up to a VCR with a LANC cable 1-26
- Basic editing with a LANC connection 1-27
- Insert editing with a LANC connection 1-28
- Programme assemble editing 1-29
- Hooking up to a VCR without a LANC cable 1-31
- Basic editing without a LANC connection 1-31
- Insert editing without a LANC connection 1-32
- Audio dubbing for commentary and background music 1-33

2. DISASSEMBLY

2-1. Removal of Upper Case 2-1
2-2. Removal of Front Panel Assembly 2-1
2-3. Removal of Control Switch Block 2-2
2-4. Removal of MF-272 Board 2-2
2-5. Removal of MF-271 Board, MF-273 Board and PL-27 Board 2-3
2-6. Removal of Bottom Plate 2-3
2-7. Removal of PS-345 Board 2-4
2-8. Removal of CP-71 Board 2-4
2-9. Removal of HF-34 Board and PV-17 Board 2-5
2-10. Removal of RV-44 Board 2-5
2-11. Removal of MA-241 Board 2-6
2-12. Removal of MD Block Assembly 2-6
2-13. Internal Views 2-7
2-14. Circuit Boards Location 2-8

3. BLOCK DIAGRAMS

3-1. Overall Block Diagram 3-1
3-2. Video Block Diagram 3-5
3-3. Servo/System Control Block Diagram 3-9
3-4. Timer/Tuner/Mode Control Block Diagram 3-11
3-5. Audio Block Diagram 3-13
3-6. Tuner Block Diagram 3-15
3-7. Power Block Diagram 3-17

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. Frame Schematic Diagram 4-1
4-2. Printed wiring Boards and Schematic Diagrams ..4-4
  - This Note is Common for Printed Wiring Boards and Schematic Diagrams 4-4
  - RV-44 Board 4-4
  - MA-241 and DC-66 Boards 4-10
  - MA-241 (Servo/Syscon) and DC-66 Boards 4-13
  - MA-241 (Input/Output, Tuner) 4-17
  - HF-34 Board 4-21
  - CP-71 and CN-92 Boards 4-24
  - PV-17 Board 4-28
  - MF-271, MF-272, MF-273 and PL-27 Boards 4-30
  - PS-345 Board 4-37

5. REPAIR PARTS LIST

5-1. EXPLODED VIEWS 5-1
  5-1-1. Case Assembly 5-1
  5-1-2. Front Panel Assembly 5-2
  5-1-3. Chassis Assembly 5-3
  5-1-4. Mechanical Deck Assembly (1) 5-4
  5-1-5. Mechanical Deck Assembly (2) 5-5
  5-1-6. Mechanical Deck Assembly (3) 5-6
  5-1-7. Mechanical Deck Assembly (4) 5-7
5-2. ELECTRICAL PARTS LIST 5-8
  - CN-92 Board 5-8
  - CP-71 Board 5-8
  - DC-66 Board 5-10
  - HF-34 Board 5-10
  - MA-241 Board 5-11
  - MF-271 Board 5-17
  - MF-272 Board 5-19
  - MF-273 Board 5-20
  - PL-27 Board 5-21
  - PS-345 Board 5-21
  - PV-17 Beoard 5-22
  - RV-44 Board 5-23
  - Hardware List 5-28

Section *Title* *Page*

6. INTERFACE AND IC PIN FUNCTION

6-1. System Control—Video Block Interface (MA-241 Board IC201) 6-1
6-2. System Control—Servo Peripheral Circuit Interface (MA-241 Board IC201)..................6-2
6-3. System Control—Mechanism Block Interface (MA-241 Board IC201) 6-3
6-4. System Control—System Control Peripheral Circuit Interface (MA-241 Board IC201) 6-4
6-5. System Control—Audio Block Interface (MA-241 Board IC201) 6-4
6-6. System Control—RF Modulator, Input Selection Block Interface (MA-241 Board IC201) 6-4
6-7. Servo/System Control Microprocessor CXP87246—096Q (MA-241 Board IC201) Port Function Description 6-5
6-8. Timer/Tuner Control Microprocessor MB89099PF-G-104-BND (MF-271 Board IC102) Port Function Description 6-7
6-9. Mode Control Microprocessor MB89096PF-G-204-BND (MF-272 Board IC301) Port Function Description 6-8

7. ADJUSTMENTS

7-1. MECHANICAL ADJUSTMENTS 7-1
7-2. ELECTRICAL ADJUSTMENTS 7-1
  2-1. Preparation Before Adjustment 7-1

Section *Title* *Page*

2-1-1. Equipment Required 7-1
2-1-2. Equipment Connection 7-2
2-1-3. Check of Input Signal 7-2
2-1-4. Alignment Tape 7-2
2-1-5. Specified Input—Output Level and the Impedance.................................7-2
2-1-6. Adjustment Procedures......................7-3
2-2. Power Supply Check 7-3
2-2-1. Output Voltage Check 7-3
2-3. Servo System Adjustment 7-4
2-3-1. RF Switching Position Adjustment 7-4
2-4. Video System Adjustments 7-4
2-4-1. X'tal OSC Check............................7-4
2-4-2. SYNC AGC Check 7-5
2-4-3. White Clip/Dark Clip Check 7-5
2-4-4. Y FM Carrier Frequency Check 7-5
2-4-5. Playback Y Level Check 7-5
2-4-6. PAL JOG Adjustment 7-6
2-4-7. 0.5H CCD Level Adjustment 7-6
2-5. Audio System Adjustments 7-7
2-5-1. VCO f_0 Adjustment 7-7
2-5-2. Deviation Check 7-8
2-5-3. Band Pass Filter f_0 Adjustment..............7-8
2-5-4. AF Switching Position Adjustment 7-9
2-5-5. ACE Head Adjustment 7-9
2-5-6. Recording Bias Adjustment..................7-9
2-5-7. E-E Output Level Check....................7-10
2-5-8. Overall Output Level and Distortion Factor Check 7-10
2-5-9. Overall Noise Level Check 7-10
2-6. Adjustmen Parts Location Diagram 7-12

SERVICE NOTE

1. REMOVAL OF DRUM ASSEMBLY

1) Remove the screw ① (P3×8)
2) Remove the shaft ground assembly ②.
3) Remove three screws ③ (P3×6).
4) Remove the drum assembly④.

Note: When attaching the drum assembly, be careful not to blur the contacting surface with fingerprint or like.
When attaching the shaft ground assembly, be careful not apply force to the spring section of it.

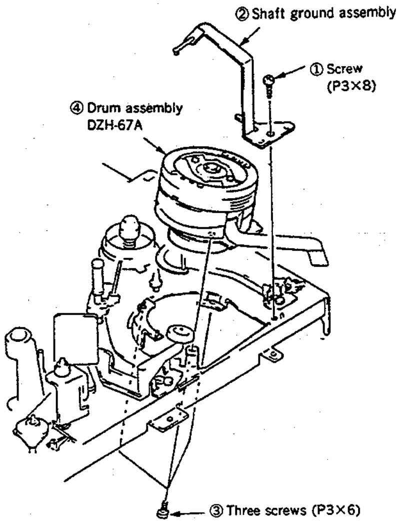


Fig.1.

2. UPPER DRUM REPLACEMENT

2-1. Removal of Upper Drum

1) Remove the screw ① (P3×8).
2) Remove the shaft ground assembly ②.
3) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows. (16 points)
4) Remove the screws ③ (PSW 3×8) and tape out the rotary upper drum assembly in the direction of arrow. (See Fig. 3.)
   If it is difficult, remove by shaking the rotary upper drum gradually.
   Note: If the drum can not be removed,check whether the solders have been removed or not again.

2-2. Mounting Upper Drum

1) Mount the rotary upper drum assembly by aligning marked ➡ with marked ⇛ of rotary transformer board (lower drum) so that the screw holes of both upper and lower drums match.

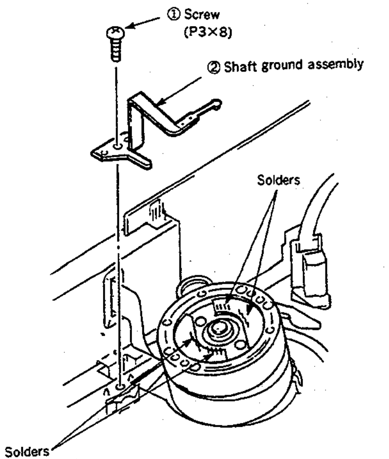


Fig. 2.

Note: When inserting the rotary upper drum assembly into the lower drum, be careful not to blur the contacting surface with fingerprint or like.

2) If it is difficult, mount the upper drum by shaking it gradually.
   Note: Be careful not to damage the head.
   Make sure that the upper drum is tightly inserted.
3) Tighten two screws ③ (PSW3×8).
   Note: Temporary tighten two screws, After making sure that upper drum is tightly inserted, tighten the screws.

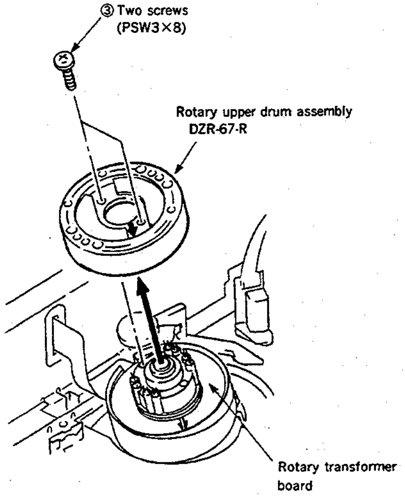


Fig. 3.

4) Solder 16 points on the rotary upper drum board. (See Fig. 2.)
5) Fix the shaft ground assembly ② using the screw ① (P3×8) so that the protrusion of the shaft ground assembly end contacts the center of the drum shaft. (See Fig. 2.)
Note: When attaching the shaft ground assembly, be careful not to apply force to the spring section of it.
6) Tighten the screw ① (P3×8).

3. PERIODIC CHECK AND REPLACEMENT

(Refer to the VHS MECHANICAL ADJUSTMENTIV (H MECHA) MANUAL.)

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

- The following must be done after every repair regardless of how many hours the user has operated the machine.

3-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fludi (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

3-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

3-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

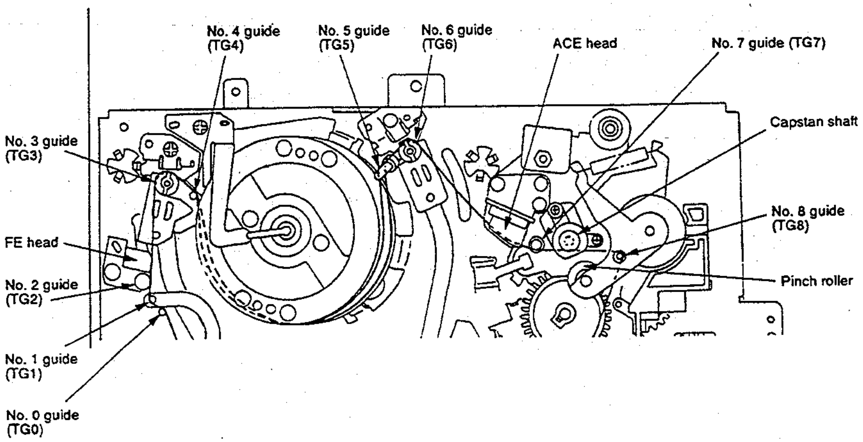


Fig. 4. Parts requiring cleaning

SLV-E1000AS/B/NP/NZ/UX/VC

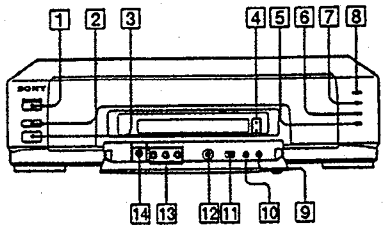
SECTION 1
GENERAL

This section is extracted from
SLV-E1000UX instruction manual.

Index to parts and controls

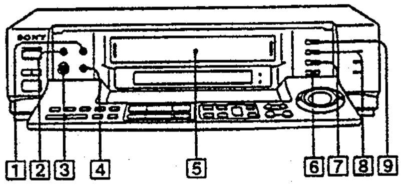
Refer to the pages indicated in ( ) for details.

Front panel, with cover closed



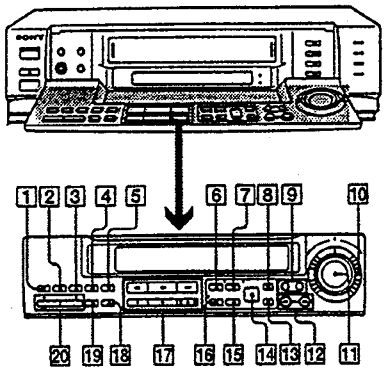
1. ON/STANDBY switch/indicator (11)
2. ⏏ EJECT button (24)
3. Remote sensor (7)
4. VIDEO INSERT/AUDIO INSERT indicators (52, 61)
5. VPS/PDC indicator (35)
6. TIMER REC indicator (32, 34, 37)
7. ● REC (recording) indicator
8. OPC indicator (42)
9. RF CHANNEL button (11)
10. EASY SET UP button (12)
11. COMMAND MODE selector (8)
12. ⟁LANC jack (47)
13. LINE IN 2 jacks (47, 57, 62)
14. MIC (microphone) jack (62)

Front panel, with cover opened



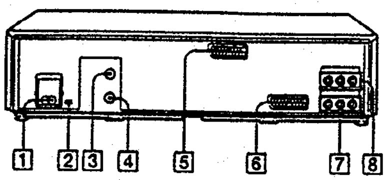
1. REC LEVEL (recording level) control (27, 63)
2. REC BALANCE (recording balance) control (27)
3. PHONES jack
4. PHONE LEVEL control
5. Tape compartment
6. TAPE SELECT switch (26)
7. PICTURE selector (25)
8. NTSC PB switch (25)
9. COLOUR SYSTEM switch (25)

Front panel, with cover opened



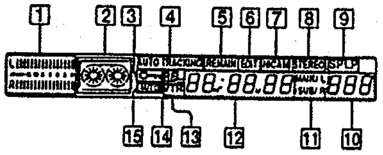
1. TV/VTR button (29)
2. INPUT SELECT button (27, 49)
3. VPS/PDC (ON/OFF) button (35)
4. COUNTER RESET button (25, 51)
5. COUNTER/REMAIN button (26)
6. ASSEMBLE button (54)
7. EDIT STANDBY button (49)
8. EDIT button (49)
9. INDEX MARK/ERASE buttons (43)
10. SHUTTLE ring (50)
11. JOG dial (50)
12. ⏮/⏭ INDEX SEARCH buttons (43)
13. BACK button (54)
14. SYNCHRO EDIT/START button (49)
15. MARK button (54)
16. LANC REMOTE button (50)
17. Tape transport buttons
    - ◀◀ REW (rewind) button (24, 40)
    - ▷ PLAY button (24, 40, 51)
    - ▶▶ FF (fast-forward) button (24)
    - ■ STOP button (24, 27, 55)
    - ❙❙ PAUSE button (24, 51)
    - ● REC (record) button (27, 55)
18. QUICK TIMER button (28)
19. TAPE SPEED (SP/LP) button (27, 49)
20. PROGRAM +/– buttons (11, 27)

Rear panel



1 AC IN connector (6)
2 RF MODULATOR switch (6)
3 AERIAL OUT connector (6)
4 AERIAL IN connector (6)
5 ⇥EURO-AV (LINE IN 3) connector (57)
6 ↦EURO-AV (LINE 1) connector (6)
7 LINE OUT 2 AUDIO/VIDEO jacks (6, 47, 57)
8 LINE IN 4 AUDIO/VIDEO jacks (57)

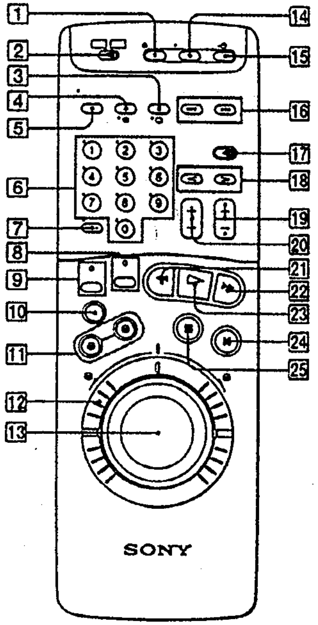
Display window


1
2
3
4
5
6
7
8
9
AUTO TRACKING
REMAIN
EDIT
NICAM
STEREO
SP LP
L
R
RF
VTR
88:88.88
MAIN L
SUB R
888
15
14
13
12
11
10

1 Peak level meters
2 Tape indicator (27)
3 Child lock indicator (10)
4 AUTO TRACKING indicator (42)
5 REMAIN indicator (26)
6 EDIT indicator (49)
7 NICAM indicator (29)
8 STEREO indicator (29)
9 Tape speed indicators (27)
10 Line/Programme position indicator (27)
11 Bilingual sound indicators (26, 30)
12 Linear time counter/Clock (15, 25)
13 VTR indicator (29)
14 RF indicator (11)
15 AUTO indicator

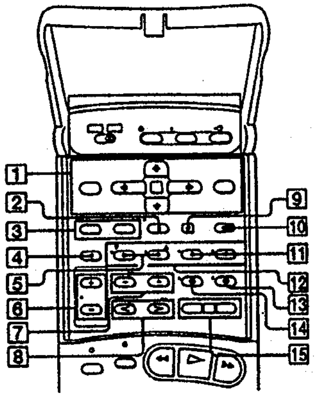
Index to parts and controls
(continued)

Remote commander
(front, with cover closed)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
1
2
3
4
5
6
7
8
9
0
SONY

1 ≜ EJECT button (24)
2 TV/VTR remote control switch (7)
3 COUNTER/REMAIN button *(for VCR)* (26)
○ TV power on/TV mode select button *(for TV)* (7)
4 COUNTER RESET button *(for VCR)* (25)
⊜ Teletext button *(for TV)* (7)
5 AUDIO MONITOR button (26, 30)
6 Programme number buttons (27)
7 -/– (ten's digit) button (27)
8 PROG (programme) function button/indicator (27)
9 JOG/SHUTTLE function button/indicator (41)
10 SKIP button (40)
11 ⊖/⊕ SEARCH buttons (40)
12 SHUTTLE ring (24, 41)
13 JOG dial (24, 41)
14 TV/VTR button (29)
15 ⏻ (on/standby) button (12)
16 ⏮/⏭ INDEX SEARCH buttons (43)
17 COMMAND MODE selector (8)
18 SHUTTLE EDIT < > buttons
19 PROG (programme) +/– button (27)
▲/▼ Teletext page access button *(for TV)* (7)
20 VOL (volume) +/– button *(for TV only)* (7)
21 ◄◄ REW (rewind) button (24, 40)
22 ►► FF (fast-forward) button (24, 40)
23 ▷ PLAY button (24)
24 ❙❙ PAUSE button (24)
25 ■ STOP button (24, 27)

Remote commander (front, with cover opened)



1 Menu buttons (12, 16)
  MENU button
  CURSOR ↑/↓/←/→ buttons
  EXECUTE button

2 DISPLAY button (25)

3 INSERT AUDIO/VIDEO buttons (52, 60, 62)

4 TRACKING AUTO/MANU button (42)

5 ▼/▲TRACKING NORMAL/SLOW STILL ADJUST buttons (42)

6 PROG +/– buttons *(for VCR)* (27)

  Teletext page access buttons *(for TV)* (7)

7 ▮► SLOW –/+ buttons (40)

8 ◄II /II► FRAME </> buttons (40)

9 TIMER CLEAR button (38)

10 COMMAND MODE selector (8)

11 INDEX MARK/ERASE buttons (43)

12 FASTEXT buttons *(for TV only)* (7)

13 INPUT SELECT button *(for VCR)* (49)

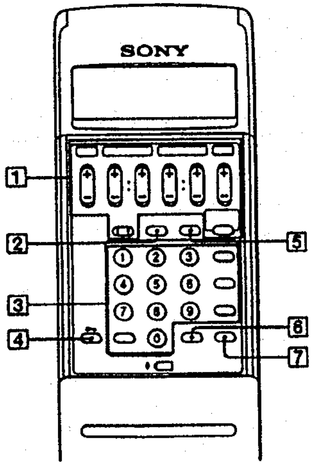
  ○ TV mode select button *(for TV)* (7)

14 TAPE SPEED (SP/LP) button (27)

  Teletext button *(for TV)* (7)

15 ● REC buttons (27)

Remote commander (rear, with cover opened)



1 Timer recording/clock buttons (15, 31)
  DAY button
  START time buttons
  STOP time buttons
  PROG (programme position) button
  TRANSMIT button
  CLOCK SET button

2 TAPE SPEED button (31)

3 VIDEO Plus+ buttons (36)
  VIDEO Plus+ number buttons
  VIDEO Plus+ button
  ONCE button
  DAILY button
  WEEKLY button

4 ⊶ (child lock) button (10)

5 INPUT SELECT button (34)

6 TIMER CHECK button (38)

7 TIMER CLEAR button (38)

Welcome!

Thank you for purchasing the Sony Video Cassette Recorder (VCR). Here are some of the features you'll enjoy with your VCR:

- EASY SET UP that guides you through necessary VCR setups sequentially through the TV screen
- JOG dial and SHUTTLE ring for easy search operations
- ↺LANC jack to connect peripheral equipment such as a comcorder which can then be controlled by this VCR
- Optimum Picture Control (OPC) that automatically optimizes recording and playback performance
- Dynamic Signal Filter (DSF) that boosts and stabilizes signals
- Dual-sided remote commander for ease of operation
- VIDEO Plus+* system that lets you quickly and easily preset the VCR to record programmes
- RC (Rewritable Consumer)-Time Code reader that allows you high precision editing by connecting a camcorder equipped with RC-Time Code feature

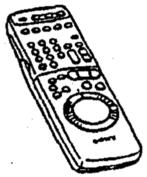
- VIDEO Plus+ and PlusCode are Trademarks of Gemstar Development Corp. VIDEO Plus+ system is manufactured under licence from Gemstar Development Corporation.

Compatible colour systems
This VCR is designed to record and play back using the PAL colour system. Recording of video sources based on other colour systems cannot be guaranteed.

Step 1 Unpacking

Check that you have the following items:

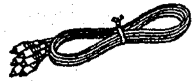
- Remote commander



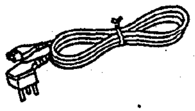
- R6 (size AA) batteries

- Aerial cable

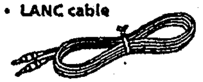
- Audio/video cable



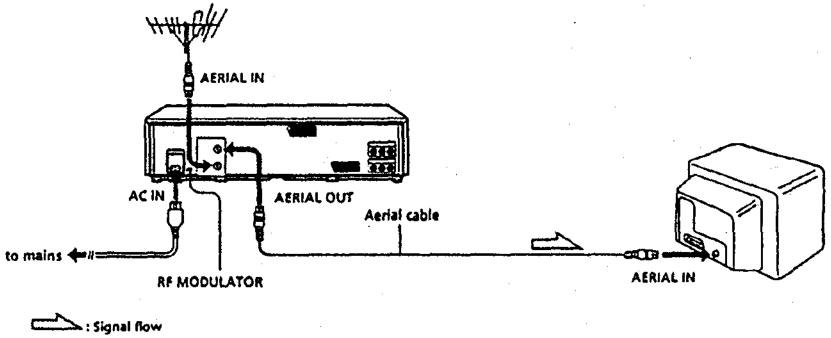
- Mains lead



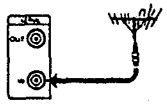
- LANC cable



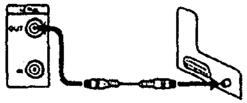
Step 2 Connecting the VCR


AERIAL IN
AC IN
AERIAL OUT
Aerial cable
to mains
RF MODULATOR
AERIAL IN
: Signal flow

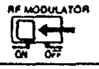
1 Disconnect the aerial input cable from your TV and connect it to AERIAL IN of the VCR.



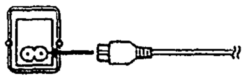
2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



3 Set the RF MODULATOR switch to ON.

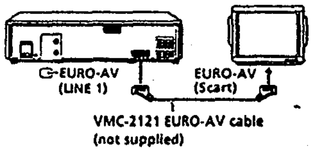

RF MODULATOR
ON
OFF

4 Connect AC IN of the VCR and the mains supply using the mains lead.
You've completed the basic hookup to watch and record TV programmes.

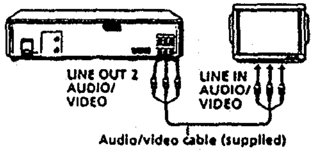


Additional connections

To a TV that has a EURO-AV (Scart) connector
This additional connection can improve picture and sound quality. Connect to the TV as shown on the right.


EURO-AV (LINE 1)
EURO-AV (Scart)
VMC-2121 EURO-AV cable (not supplied)

To a TV that has phono-type audio/video input jacks
This additional connection can improve picture and sound quality. Connect to the TV as shown on the right.

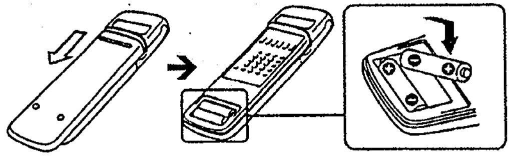

LINE OUT 2 AUDIO/ VIDEO
LINE IN AUDIO/ VIDEO
Audio/video cable (supplied)

Tip

- When the TV is connected to the EURO-AV (LINE 1) connector or LINE OUT 2 AUDIO/VIDEO jacks, setting the RF MODULATOR switch to OFF is recommended. In the OFF position, only the signal from the aerial is output through the AERIAL OUT connector.

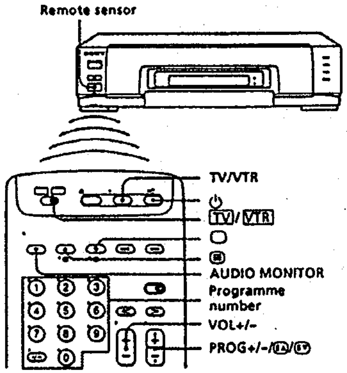
Step 3 Setting up the remote commander

Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Using the remote commander

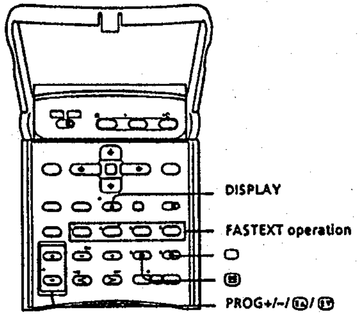
You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your TV.



To operate	Set TV/VTR to
the VCR	VTR and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

TV control buttons

To	Press
Turn the TV into standby	⏻
Select an input source of the TV either from aerial in or from line in	TV/VTR
Select the programme position of the TV	Programme number
Switch to TV mode (Teletext off)	○ (TV power/mode select)
Switch to Teletext mode	⊞ (Teletext)
Change the programme position of the TV	PROG +/–
Increase (+) or decrease (–) the volume of the TV	VOL +/–
Select the sound	AUDIO MONITOR
Use FASTEXT	FASTEXT operation
Get on-screen display	DISPLAY
Change the Teletext page	▲/▼

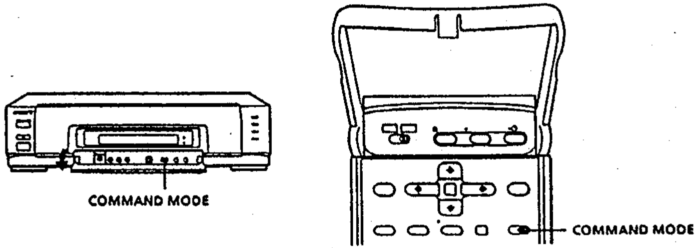


Notes

- With normal use, the batteries should last for approximately three to six months. When battery power gets low, the ▭ symbol appears in the remote commander display.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Controlling this VCR and other Sony video equipment separately

You can select three different positions for the command mode setting to avoid having this VCR and the other video equipment functioning simultaneously.



If other Sony video equipment has a COMMAND MODE selector

1 Set the COMMAND MODE VTR 1/2/3 selector on the remote commander to a position other than the one you selected for the other video equipment .
2 Set the COMMAND MODE selector on this VCR to the same position you selected in step 1.

If other Sony video equipment does not have a COMMAND MODE selector

The command modes of the video equipment are determined according to the VCR format. To control the other video equipment, set the COMMAND MODE VTR 1/2/3 selector on the remote commander as follows:

Video equipment	Set COMMAND MODE VTR 1/2/3 to
Infrared remote controlled Sony Betamax VCRs	1*
Sony 8 mm format VCRs	2
Sony VHS format VCRs	3

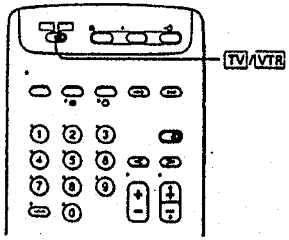
* Some units may not be controlled in this mode.

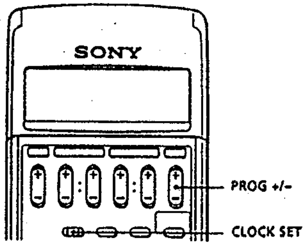
Note

- If you set the COMMAND MODE VTR OFF/1/2/3 selector on the VCR to "OFF," you can no longer control this VCR from any other Sony remote commanders.

Controlling other TVs

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.





1 Set the TV/VTR switch on the top of the remote commander to TV.
2 Slide down the back cover of the remote commander.
3 While holding down CLOCK SET, press PROG +/– to select your TV's code number(s) in the remote commander display.
Now you can use the TV control buttons to control your TV.

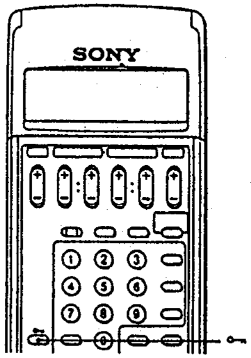
Code numbers of controllable TVs
If more than one code number is listed, try entering them one at a time until you find the code number that works with your TV.

Manufacturer	Code number	Manufacturer	Code number
Sony	01	Nokia (ITT)	16
Philips	06, 07, 08	Panasonic	17, 49
Grundig	10, 11	Telefunken	36

Notes
- If the TV uses a different remote control system from the one preprogrammed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number.

Disabling all the controls/buttons (Child lock function)

To avoid inadvertent operation, you can disable all the controls and buttons on the VCR and on the remote commander.



Slide down the back cover of the remote commander and press ⚷ for a few seconds
The ⚷ indicator appears in the display window of the VCR and all the controls and buttons are disabled. If you press a button, a beep sounds and the ⚷ indicator blinks.

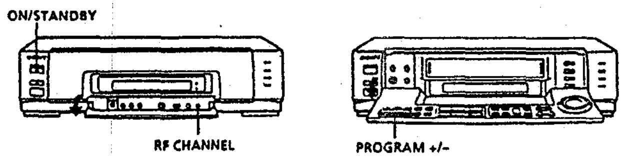
To cancel the disabled condition
Keep ⚷ pressed for a few seconds until the ⚷ indicator disappears.

Tip
- To cancel the disabled condition when you do not have the remote commander at hand, disconnect the mains lead from the mains supply and connect it again.

Note
- The slide switches and rotary controls (except JOG/SHUTTLE) on the VCR cannot be disabled with this function.

Step 4 Tuning the TV to your VCR

If you have connected the VCR to your TV using the EURO-AV cable, skip this step.

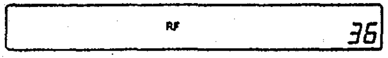

ON/STANDBY
RF CHANNEL
PROGRAM +/-

1

Press ON/STANDBY to turn on the VCR.

2

Press RF CHANNEL on the VCR.
The factory-preset RF channel appears in the display window.
The VCR signal is output through this channel to the TV.

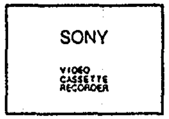


3

Turn on your TV and select a programme position for video playback.

4

Tune the TV to the same channel as that shown in the display window so that the picture on the right appears on the TV screen.
Refer to your TV manual for tuning instructions.
If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.


SONY
VIDEO
CASSETTE
RECORDER

5

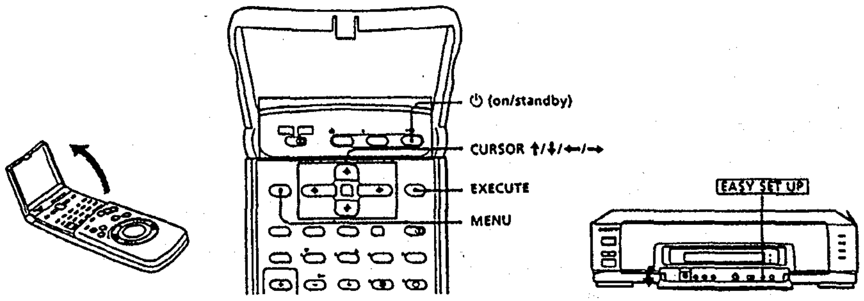
Press RF CHANNEL.
You have now tuned your TV to the VCR. Whenever you play a tape, set the TV to the programme position selected in step 3 above.

To check to see if the TV tuning is correct
Select the programme position for video playback on the TV and press PROGRAM +/–. If the TV screen changes to a different programme each time you press PROGRAM +/–, the TV tuning is correct.

To obtain a clear picture from the VCR
If the picture does not appear clearly in step 4 above, press PROGRAM +/– in step 4, while the RF channel is displayed, so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Step 5 Setting up the VCR sequentially (EASY SET UP)

Before using the VCR for the first time, set up the VCR using the EASY SET UP function. With this function, you can set the language for the on-screen display, TV channels, guide channels for VIDEO Plus+, and the clock, guided by the sequence indicated on the TV screen.


⏻ (on/standby)
CURSOR ↑/↓/←/→
EXECUTE
MENU
EASY SET UP

1

Press ⏻ (on/standby) to turn on the VCR.

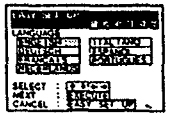
2

Turn on your TV and select a programme position for video playback.

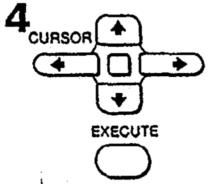
3

Press EASY SET UP on the VCR.
The language select menu appears on the TV screen.

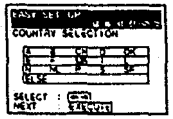
To cancel starting the EASY SET UP function, press EASY SET UP.


EASY SET UP
LANGUAGE
SELECT :
NEXT :
CANCEL :

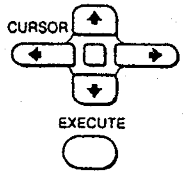
4


CURSOR
EXECUTE

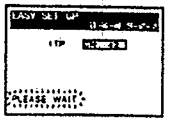
Press CURSOR ↑/↓/←/→ to highlight the desired on-screen display language, then press EXECUTE.
The country abbreviations for ITP (Intelligent Tuner Preset) appear.


EASY SET UP
COUNTRY SELECTION
ELSE
SELECT :
NEXT :

5


CURSOR
EXECUTE

Press CURSOR ←/→ to highlight the abbreviation of your country, then press EXECUTE.
ITP starts searching for all the receivable channels.
ITP sorts the located channels appropriately for the selected country and presets them to the programme positions. Some VIDEO Plus+ guide channels and station IDs may also be preset if ITP can detect them.
During presetting, the channel being located is displayed on the TV screen.

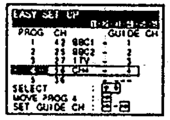

EASY SET UP
ITP
PLEASE WAIT

The abbreviations of the countries are as follows:

A:	Austria	I:	Italy
B:	Belgium	L:	Luxemburg
CH:	Switzerland	N:	Norway
D:	Germany	NL:	Netherlands
DK:	Denmark	P:	Portugal
E:	Spain	S:	Sweden
F:	France	SF:	Finland
UK:	United Kingdom	ELSE:	other countries

If your country does not appear, select ELSE.

When all the channels are preset, the following screen appears.

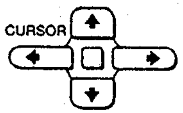

EASY SET UP
PROG
CH
GUIDE CH
BBC1
BBC2
ITV
CH4
SELECT
MOVE PROG 4
SET GUIDE CH

If necessary, you can add or disable the channels manually.
See "Tuning the VCR to TV channels manually" on page 19.

Note

- Do not exit EASY SET UP while ITP is presetting channels. If you do, repeat EASY SET UP from the beginning.

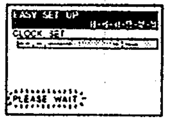
6



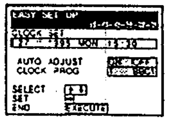
Using CURSOR ↑/↓/←/→, set the VIDEO Plus+ guide channels that could not be preset automatically, and change the programme positions of the stations. (If not necessary, skip this step.)
The setting procedures are the same as those described in "Setting up VIDEO Plus+ manually" on page 21 and "Changing the programme positions of the stations" on page 23.

7

Press EXECUTE.
Auto Clock Set starts searching for a TV station that carries the time signal and sets the clock time automatically. The date is also set if the date data is transmitted from the TV station.

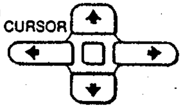

EASY SET UP
CLOCK SET
PLEASE WAIT

When the clock setting is completed, the following screen appears.
If the VCR does not receive the time signal from any station, "1.1. 1995 SUN 0:00" appears and AUTO ADJUST is set to OFF.


EASY SET UP
CLOCK SET
MON
AUTO ADJUST
CLOCK PROG
OFF
BBC1
SELECT
SET
END
EXECUTE

(continued)

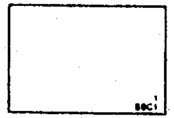
8



If necessary, adjust the date and/or time manually and change the station for Auto Clock Set using CURSOR ↑/↓/←/→.
The setting procedures are the same as those described in "Setting the clock manually" on page 17.

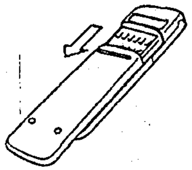
9

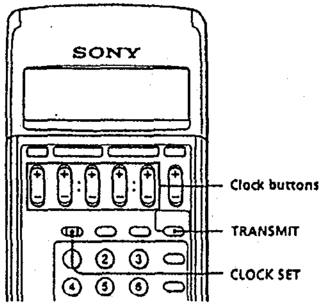
Press EXECUTE to finish the EASY SET UP operation.
A programme position appears on the TV screen.
The station ID may also appear if the VCR has detected it.



Step 6 Setting the clock on the remote commander

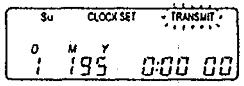
You must set the clock on the remote commander for programming the timer recording. To set the clock, you may use the clock in the VCR display window which you have set in the EASY SET UP procedure.



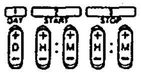


1

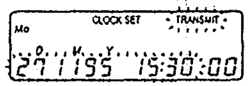
Slide down the back cover of the remote commander, and press CLOCK SET.
The words "CLOCK SET" appear in the remote commander display.



2

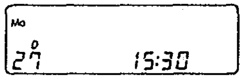


Press the clock buttons until the current time and date appear.
To set the current time and date, press DAY D +/– for the date, START H +/– for the month, START M +/– for the year, STOP H +/– for the hour, and STOP M +/– for the minutes. You can make the settings in any order.
To cycle backwards, press the minus (–) side of the buttons.
The day of the week is set automatically.



3

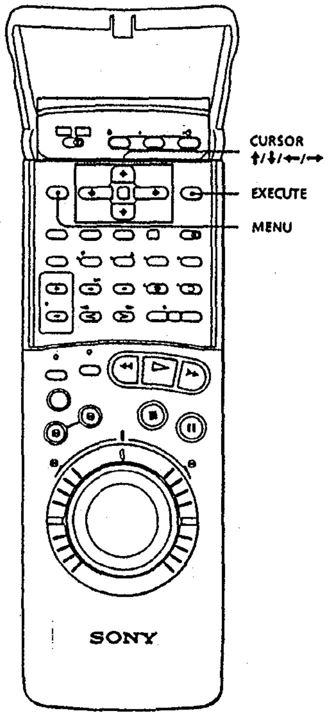
Press CLOCK SET.
The remote commander display shows the time and date.



Setting the VCR clock using the clock on the remote commander
If the VCR clock is wrong due to a power failure, etc., press TRANSMIT on the remote commander. The clock data on the remote commander is transmitted to the VCR.

Note
- If AUTO ADJUST in the CLOCK SET menu is set to ON, the VCR clock is readjusted automatically by the time signal from the TV station. Therefore, if the clock on the remote commander transmitted to the VCR is not correct, the two clocks may show different times.

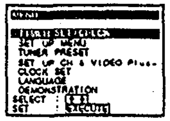
Selecting a language manually



Tip
- To demonstrate the main features of the VCR on the TV screen, select DEMONSTRATION in the main MENU and press EXECUTE.
  To stop the demonstration, press MENU.

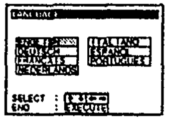
If you prefer other on-screen display language to English, you can change it using the menu.

1 Lift the cover of the remote commander, and press MENU.
  The main MENU appears on the TV screen.



MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT : ↑↓
SET : EXECUTE

2 Press CURSOR ↑/↓ to move the cursor (▮) to LANGUAGE, then press EXECUTE.
  The language select menu appears.

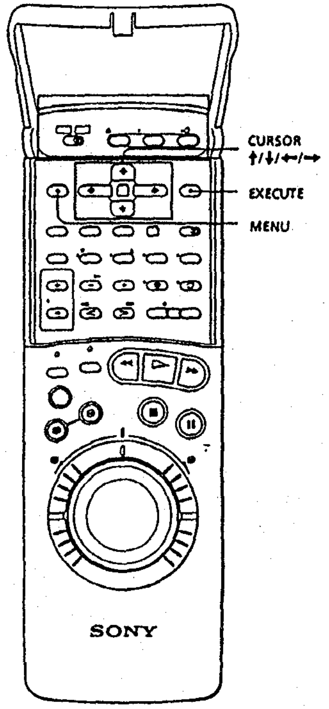


LANGUAGE
ENGLISH
DEUTSCH
FRANCAIS
NEDERLANDS
ITALIANO
ESPAÑOL
PORTUGUES
SELECT : ↑↓←→
END : EXECUTE

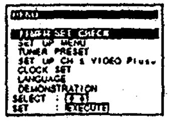
3 Press CURSOR ↑/↓/←/→ to highlight the desired language, then press EXECUTE.

Setting the clock manually

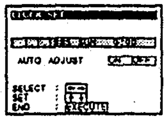
You must set the time and date on the VCR to be able to use the timer recording features properly. You can set the VCR clock using the menu.


CURSOR ↑/↓/←/→
EXECUTE
MENU
SONY

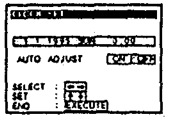
1 Lift the cover of the remote commander, and press MENU.
The main MENU appears on the TV screen.


MENU
TIMER SET CHECK
SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT : ↑ ↓
SET : EXECUTE

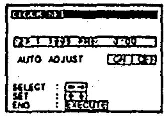
2 Press CURSOR ↑/↓ to move the cursor (▮) to CLOCK SET, then press EXECUTE.
The CLOCK SET menu appears.


CLOCK SET
AUTO ADJUST
ON OFF
SELECT
SET
END
EXECUTE

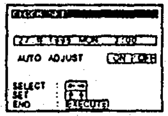
3 Press CURSOR → to highlight the day and the day of the week.


CLOCK SET
AUTO ADJUST
ON OFF
SELECT
SET
END
EXECUTE

4 Press CURSOR ↑/↓ to set the day.
The day of the week is set automatically.


CLOCK SET
AUTO ADJUST
ON OFF
SELECT
SET
END
EXECUTE

5 Press CURSOR → to highlight the month and set the month using CURSOR ↑/↓.


CLOCK SET
MON
AUTO ADJUST
ON OFF
SELECT
SET
END
EXECUTE

(continued)

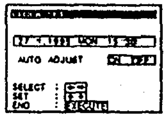
Note
- The menu disappears automatically if you don't proceed for more than a few minutes.

Tip
- To change the digits during setting, press CURSOR ← to return to the item to be changed, and select the digits using CURSOR ↑/↓.

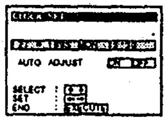
Setting the clock manually (continued)

Tip
- If you set AUTO ADJUST to ON, the Auto Clock Set is activated whenever the VCR is turned off. The date and time is adjusted automatically by making reference to the time signal from the station whose programme position is displayed in the "CLOCK PROG" row.
If you do not need the Auto Clock Set, highlight OFF.

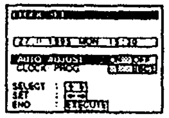
6 Set the year, hour and minutes in sequence, using CURSOR → to highlight the item to be set, and CURSOR ↑/↓ to select the digits.


CLOCK SET
MON
AUTO ADJUST
ON OFF
SELECT
SET
END
EXECUTE

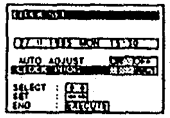
7 Press CURSOR → to confirm the setting.
The cursor (▮) appears in the leftmost column.


CLOCK SET
AUTO ADJUST
ON OFF
SELECT
SET
END
EXECUTE

8 Press CURSOR ↓ to move the cursor (▮) to AUTO ADJUST, then press CURSOR ←/→ to highlight ON.


CLOCK SET
MON
AUTO ADJUST
CLOCK PROG
SELECT
SET
END
EXECUTE

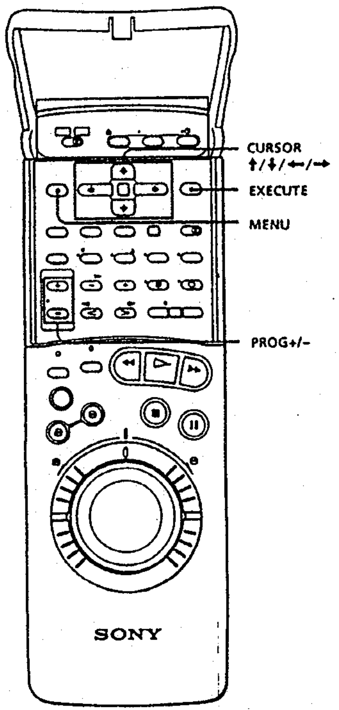
9 Press CURSOR ↓ to move the cursor (▮) to CLOCK PROG, then press CURSOR ←/→ repeatedly until the programme position of the station that carries the time signal appears.
If the VCR does not receive the time signal from any station, AUTO ADJUST returns to OFF automatically.


CLOCK SET
MON
AUTO ADJUST
ON OFF
CLOCK PROG
SELECT
SET
END
EXECUTE

10 Press EXECUTE to start the clock.

Tuning the VCR to TV channels manually

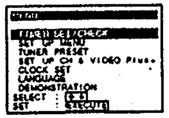
You may have preset the receivable channels in your area in the EASY SET UP procedure (page 12). If some channels could not be preset automatically, you can preset them manually; if there are unwanted channels among the preset ones, you can disable the channels.



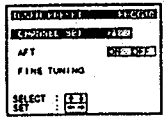
Notes
- The menu disappears automatically if you don't proceed for more than a few minutes.
- The station IDs aren't preset in manual tuning.

Presetting channels manually

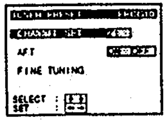
1 Lift the cover of the remote commander, and press MENU.
The main MENU appears on the TV screen.



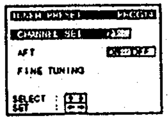
2 Press CURSOR ↑/↓ to move the cursor (▌) to TUNER PRESET, then press EXECUTE.
The TUNER PRESET menu appears.



3 Press CURSOR ↑/↓ to move the cursor (▌) to CHANNEL SET.



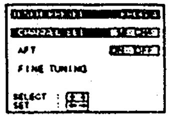
4 Press PROG +/– to select the programme position.



(continued)

Tuning the VCR to TV channels manually (continued)

5 Press CURSOR → to start tuning.
The VCR starts searching for a channel and displays the first one it finds on the TV screen. Press CURSOR ←/→ repeatedly until the channel you want is displayed.
The channels are scanned in the following order:
UHF B21 - B69



If you know the number of the channel you want, press the programme number buttons. For example, for channel 43, first press "4" and then press "3."

6 To allocate another channel to another programme position, repeat steps **4** and **5**.

7 Press EXECUTE to store all the allocated channels.

Disabling unwanted programme positions

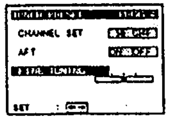
After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

1 Press MENU, then select TUNER PRESET and press EXECUTE.
2 Select CHANNEL SET.
3 Press PROG +/– until the programme position you want to disable appears beside "PROG" on the TV screen.
4 Press programme number button "0" twice to display the number "0" beside CHANNEL SET.
5 Repeat steps **3** and **4** for other positions you want to disable.
6 Press EXECUTE.

If the picture is not clear

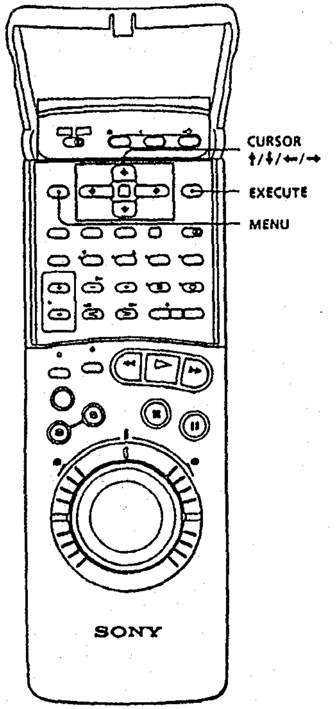
Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.
2 Press MENU, then select TUNER PRESET and press EXECUTE.
3 Select FINE TUNING. The fine tuning meter appears.



4 Press CURSOR ←/→ to get a clearer picture, then press EXECUTE.
Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Setting up VIDEO Plus+ manually


CURSOR
↑/↓/←/→
EXECUTE
MENU
SONY

Note
- The menu disappears automatically if you don't proceed for more than a few minutes.

VIDEO Plus+ is a feature in Sony VCRs that simplifies the task of programming the VCR to make timer recordings.

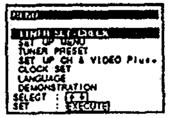
How VIDEO Plus+ works

Whenever you want to record a TV programme, all you need to do is look up the programme's "PlusCode," a number assigned to each programme that's published in TV guide magazines. Then, just enter the PlusCode of the programme you want and the VCR is automatically programmed to record that show. It's that simple. With VIDEO Plus+, you no longer have to go through a lengthy and often repetitive procedure when you set start and stop times, channel numbers, and dates. All this information is automatically sent to your VCR when you enter the programme's PlusCode.

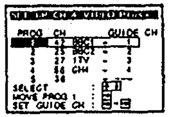
- If you want to record satellite broadcasts using VIDEO Plus+, see page 22.

Setting the guide channels

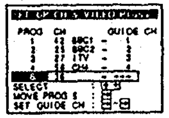
1 Lift the cover of the remote commander, and press MENU.
The main MENU appears on the TV screen.


MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT :
SET : EXECUTE

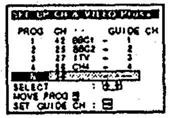
2 Press CURSOR ↑/↓ to move the cursor (▮) to SET UP CH & VIDEO Plus+, then press EXECUTE.
The SET UP CH & VIDEO Plus+ menu appears.
The preset channels are displayed on the screen. The station IDs and guide channels also appear if the VCR detected them in EASY SET UP. "---" in the GUIDE CH column means that the guide channel has not been preset.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
1 42 BBC1 - 1
2 25 BBC2 - 2
3 27 ITV - 3
4 56 CH4 - 4
5 36
SELECT :
MOVE PROG 1 :
SET GUIDE CH :

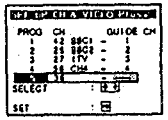
3 Press CURSOR ↑/↓ to move the cursor (▮) to the row on which you want to set the guide channel.
To display other pages for programme positions 6 to 60, press CURSOR ↑/↓ repeatedly.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
MOVE PROG 5 :
SET GUIDE CH :

4 Press CURSOR → to highlight the TV channel and guide channel.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
MOVE PROG :
SET GUIDE CH :

5 Press CURSOR → to highlight the guide channel only.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
SET :

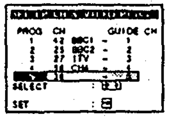
(continued)

Setting up VIDEO Plus+ manually (continued)

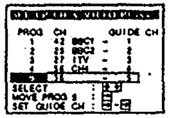
Notes
- If you use a satellite tuner connected via the EURO-AV (LINE 1) (Scart) connector, leave the GUIDE CH column blank (---).
If you inadvertently entered a guide channel number, press CURSOR ↑/↓ repeatedly to reset the "GUIDE CH" column to "---". "---" appears between 1 and 255.
- If you use a satellite tuner connected to the other LINE IN jacks, select the addressed input on the TIME SET/CHECK menu. See "Checking/changing/cancelling timer settings" on page 38.
- The VCR does not allow entering the guide channel number, if the same number has been set.

Note
- When you record a satellite broadcast using VIDEO Plus+, you need to select the desired channel on the satellite tuner manually.

6 Press CURSOR ↑/↓ to select the guide channel number assigned in the programme guide.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
SET :

7 Press CURSOR → to confirm the setting.
The cursor (▮) appears in the leftmost column.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
MOVE PROG 5 :
SET GUIDE CH :

8 To set the guide channel of another station, repeat steps 3 to 7.
If you want to change the programme positions of the stations, proceed to step 2 of "Changing the programme positions of the stations" on page 23.

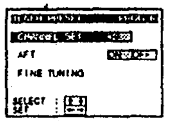
9 When you've finished, press EXECUTE to exit.

Setting up VIDEO Plus+ for satellite broadcasts

When your satellite tuner is connected via the AERIAL IN connector or LINE IN jacks, first you have to set the programme position for each satellite channel using the TUNER PRESET menu. Then set the guide channel number for each satellite channel using the SET UP CH & VIDEO Plus+ menu.

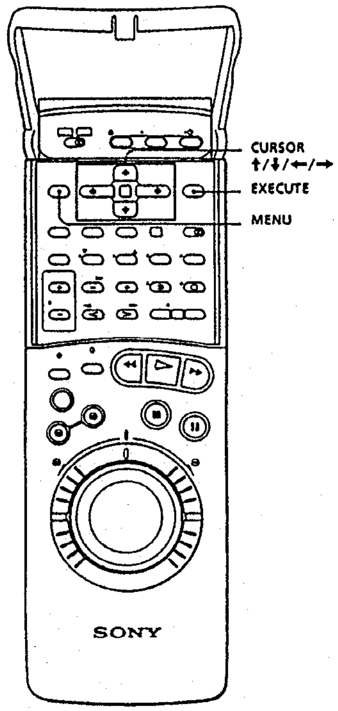
If your satellite tuner is connected via the EURO-AV (Scart) connector or LINE IN jacks, you don't have to set programme positions nor guide channel numbers for satellite channels. Skip the following operations.

1 Turn on the satellite tuner.
2 Press MENU, then select TUNER PRESET and press EXECUTE.
3 Press PROG +/– to select a programme position you want to use for watching a satellite channel.
4 Select CHANNEL SET, then press CURSOR → to tune the VCR to the satellite tuner.
The channel number displayed beside CHANNEL SET is used for receiving all satellite broadcasts from the satellite tuner.


TUNER PRESET
CHANNEL SET
AFT ON OFF
FINE TUNING
SELECT :
SET :

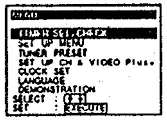
5 Press PROG +/– to select another programme position for another satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 4.
Repeat this step for all satellite channels.
6 Set the guide channel number for each programme position assigned to the satellite channel, following the procedures in "Setting the guide channels" on pages 21 and 22.

Changing the programme positions of the stations

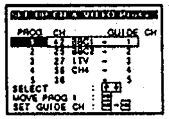

CURSOR
↑/↓/←/→
EXECUTE
MENU
SONY

After setting the channels and VIDEO Plus+ guide channels, you can change the programme positions which are automatically assigned, as you like.

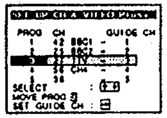
1 Lift the cover of the remote commander, and press MENU.
The main MENU appears on the TV screen.


MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT :
SET : EXECUTE

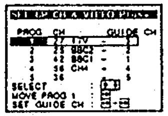
2 Press CURSOR ↑/↓ to move the cursor (▌) to SET UP CH & VIDEO Plus+, then press EXECUTE.
The SET UP CH & VIDEO Plus+ menu appears.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
MOVE PROG ↕ :
SET GUIDE CH :

3 Press CURSOR ↑/↓ to move the cursor (▌) to the row on which you want to change the programme position, then press CURSOR →.
The TV channel and guide channel are highlighted.
To display other pages for programme positions 6 to 60, press CURSOR ↑/↓ repeatedly.


SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
MOVE PROG ↕ :
SET GUIDE CH :

4 Press CURSOR ↑/↓ until the channel and guide channel row moves to the desired programme position, then press CURSOR ←.
The two rows exchange the positions.

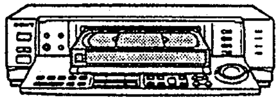

SET UP CH & VIDEO Plus+
PROG CH GUIDE CH
SELECT :
MOVE PROG ↕ :
SET GUIDE CH :

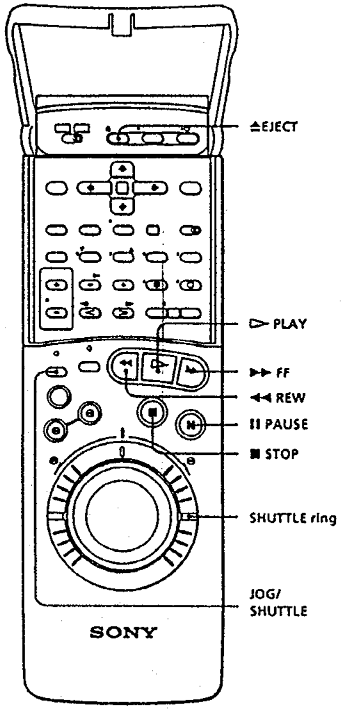
5 To change the programme position of another station, repeat steps **3** and 4.

6 When you've finished, press EXECUTE to exit.

Basic Operations

Playing a tape




≜EJECT
▷ PLAY
▸▸ FF
◂◂ REW
II PAUSE
■ STOP
SHUTTLE ring
JOG/SHUTTLE
SONY

Tip
- For further information on searching and playback functions, see "Playing/searching at various speeds" on page 40.

This section shows you how to play back a video tape.

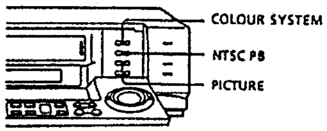
1 Turn on your TV and tune in to the VCR:
- If the TV is connected to the VCR using the EURO-AV cable, set the TV to video input.
- If the TV is connected to the VCR using only the aerial cable, set the TV to the programme position for the VCR.

2 Open the drop down panel and insert a tape.
The VCR turns on automatically. The tape starts playing automatically if its safety tab has been removed. (See page 30.)

3 Press ▷ PLAY to start playing.
When the tape reaches the end, the VCR automatically rewinds it to the beginning. (The power remains on.)

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Search forward	▸▸ FF during playback
Search backward	◂◂ REW during playback
Fast-forward the tape	▸▸ FF during stop
Rewind the tape	◂◂ REW during stop
Eject the tape	≜ EJECT



To adjust the sharpness of the playback picture
Set the PICTURE selector on the VCR to SHARP to get a sharp picture, or to SOFT for a soft picture. (The normal setting is NORMAL.)

To set the colour system
If streaks appear during playback, set the COLOUR SYSTEM switch on the VCR to conform to the system that the tape was recorded in. (The normal setting is AUTO.)

When your tape was recorded in	Set COLOUR SYSTEM to
PAL	PAL
NTSC	NTSC

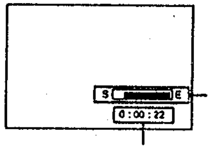
To play an NTSC-recorded tape
Set the NTSC PB switch on the VCR according to the colour system of your TV.

When your TV is	Set NTSC PB to
PAL	ON PAL TV
NTSC4.43	NTSC4.43

Notes
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - The picture becomes black and white.
  - The picture shakes.
  - No picture appears on the TV screen.
  - Black streaks appear horizontally on the TV screen.
  - The colour density increases or decreases.
- If you play back a tape recorded in LP or EP mode with NTSC system, the sound is heard in monaural.

Displaying the remaining tape length and time counter

Press DISPLAY to turn the display on or off.



Remaining tape length
The white bar represents the approximate length of tape remaining.

Time counter

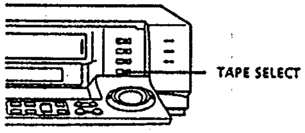
Using the time counter

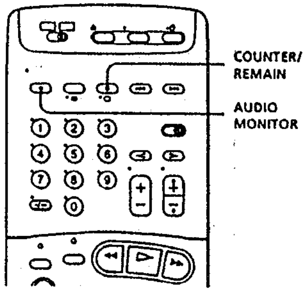
At the point on a tape that you want to find later, press COUNTER RESET to reset the counter to "0H00M00S." When you rewind or advance the tape to this point, refer to the counter.

Notes
- When a tape is reinserted, the counter returns to "0H00M00S."
- The counter will not work on tape portions with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two video systems.
- The display will not appear during still mode or slow-motion playback.

Playing a tape (continued)

Notes
- When you insert a tape with a short tape length such as E-30 or a non-standard commercially available tape, the remaining tape counter may not be correct.
- The remaining tape counter doesn't work for an NTSC-recorded tape. "-:--" appears in the display window.
- The display will not appear during still mode or slow-motion playback.
- The remaining tape counter is intended for rough measurement only.
- The remaining time will be displayed about 30 seconds after the tape is inserted.

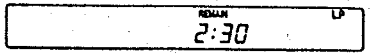




Notes
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- To play a tape in stereo, you must use the EURO-AV connection or AUDIO OUT connection.
- If AUDIO MIX in the SET UP MENU is set to ON, the AUDIO MONITOR button doesn't work.

Displaying the remaining tape counter

Press COUNTER/REMAIN to display the remaining tape counter in the display window. To display it on the TV screen, press DISPLAY to turn the display on, then press COUNTER/REMAIN. Each time you press COUNTER/REMAIN, the time counter and the remaining tape counter appear alternately.



When you use the tape with more than 3-hour recording, open the drop down panel on the VCR and set TAPE SELECT according to the tape type.

Tape type	Set TAPE SELECT to
E-300	E300
E-240/E-260	E240
E-195 or less	E195

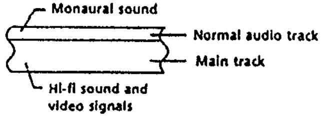
Playing stereo and bilingual programmes

Press AUDIO MONITOR to select the desired sound. Each press of the button changes the display on the VCR and TV screen.

To listen to a		Press AUDIO MONITOR until	
Stereo tape	Bilingual tape	The TV screen shows	The display window indicator shows
Stereo	Main and sub sounds	"STEREO"	"STEREO"
Left channel	Main sound	"LCH"	"MAIN/L"
Right channel	Sub sound	"RCH"	"SUB/R"
Standard sound (monaural)	Standard sound	No indication	No indication

How sound is recorded on a video tape

This VCR records sound onto two different tracks. High-fidelity sound (usually stereo) is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



Except UX model

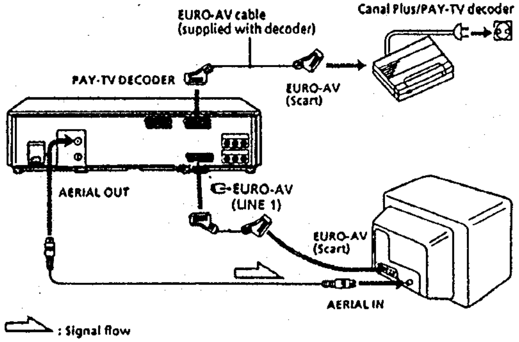
Setting the Canal Plus/ PAY-TV decoder

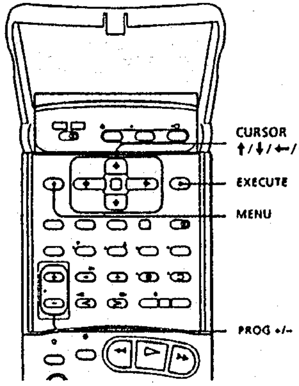
You can watch or record Canal Plus/PAY-TV programmes if you connect a decoder (not supplied) to the VCR.

Notes

- To superimpose subtitles while watching Canal Plus/ PAY-TV programmes, make both decoder-VCR and VCR-TV connections using 21-pin EURO-AV cable that are compatible with the RGB signals. You cannot record subtitles on the VCR.
- When you watch Canal Plus/PAY-TV programmes using the aerial input of the TV, press TV/VTR on the VCR or the remote commander so that the VTR indicator appears in the display window.

How to hook up


EURO-AV cable
(supplied with decoder)
Canal Plus/PAY-TV decoder
PAY-TV DECODER
EURO-AV
(Scart)
AERIAL OUT
EURO-AV
(LINE 1)
EURO-AV
(Scart)
AERIAL IN
: Signal flow

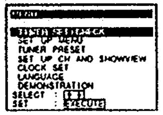

CURSOR
↑/↓/←/→
EXECUTE
MENU
PROG +/-

Setting Canal Plus/PAY-TV channels

To watch or record Canal Plus/PAY-TV programmes, set your VCR to receive the channels using the on-screen display.

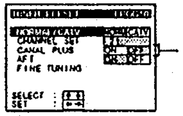
1 Turn on your decoder.

2 Lift the cover of the remote commander and press MENU.
The main MENU appears on the TV screen.


MENU
SYSTEM SET CHECK
SET UP MENU
TUNER PRESET
SET UP CH AND SHOWVIEW
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT :
SET : EXECUTE

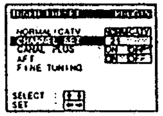
3 Press CURSOR ↑/↓ to move the cursor (▮) to TUNER PRESET, then press EXECUTE.
The TUNER PRESET menu appears.

e.g. *SLV-E1000NP*

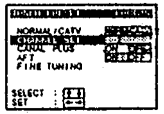

TUNER PRESET
NORMAL/CATV
CHANNEL SET
CANAL PLUS
AFT
FINE TUNING
ON OFF
ON OFF
SELECT :
SET :

For the SLV-E1000VC, PAY-TV ON/OFF appears instead.

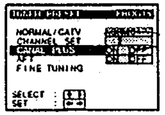
4 Press PROG +/– to select the desired programme position.


NORMAL/CATV
CHANNEL SET
CANAL PLUS
AFT
FINE TUNING
ON OFF
ON OFF
SELECT :
SET :

5 Press CURSOR ↑/↓ to move the cursor (▮) to CHANNEL SET, then tune in the Canal Plus/PAY-TV channels.

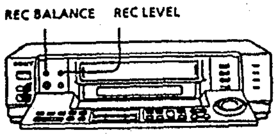

NORMAL/CATV
CHANNEL SET
CANAL PLUS
AFT
FINE TUNING
ON OFF
ON OFF
SELECT :
SET :

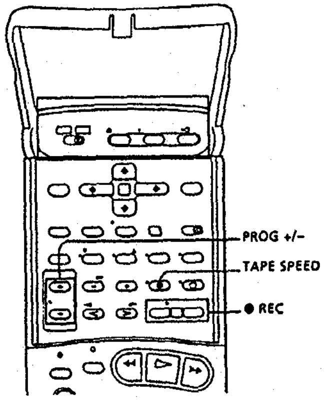
6 Press CURSOR ↑/↓/←/→ to move the cursor (▮) to CANAL PLUS (*SLV-E1000NP*) or PAY-TV (*SLV-E1000VC*), then highlight ON.


NORMAL/CATV
CHANNEL SET
CANAL PLUS
AFT
FINE TUNING
ON OFF
ON OFF
SELECT :
SET :

7 Press EXECUTE to store the setting.

Recording TV programmes





Notes
- If you insert a tape with its safety tab removed, the VCR starts playing. To record on this tape, cover the tab hole.
- If you've inserted a tape with its safety tab removed, the VCR ejects it when you press ● REC.

Tips
- To select programme positions, you can also use the programme number buttons on the remote commander. For two-digit numbers, press the -/-- (ten's digit) button followed by the programme number buttons.
- The JOG dial on the remote commander can also be used to select programme positions. Press the PROG button located next to the JOG/SHUTTLE button to turn on its indicator and turn the JOG dial. After selecting the programme, press PROG again to turn off the indicator.
- To record a video source from LINE IN jacks, press INPUT SELECT to display "L1","L2", "L3" or "L4" in the display window.

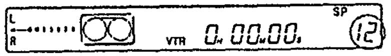
This section shows you how to record TV programmes in the most basic way: manual recording. With manual recording, you start the VCR recording when the programme begins, then stop it when the programme ends. The VCR also provides the following ways of recording:
- Manually start recording, then stop it automatically—"Recording using the quick timer" (page 28)
- Automatically start and stop recording—"Recording TV programmes using the timer" (page 31)
- Automatically start and stop recording by simply entering the "PlusCode"—"Recording TV programmes using VIDEO Plus+" (page 36)

1 Turn on your TV and tune in to the VCR:
- If the TV is connected to the VCR using the EURO-AV cable, set the TV to video input.
- If the TV is connected to the VCR using only the aerial cable, set the TV to the programme position for the VCR.

2 Open the drop down panel and insert a tape with its safety tab in place.

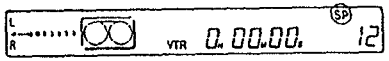
3 Set the REC LEVEL control to 5 and the REC BALANCE control to the centre on the VCR.

4 Select the desired programme position by pressing PROG +/-.



5 Select the tape speed, SP (standard play) or LP (long play), by pressing TAPE SPEED.

See "To select tape speeds" on the next page.



5 Start recording by pressing two ● REC buttons simultaneously.

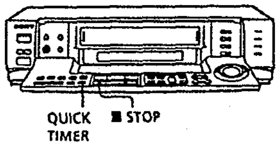
When the tape reaches the end, the VCR automatically rewinds it to the beginning.

To stop recording

Press ■ STOP.

Recording TV programmes (continued)

Tips
- To cut out an unwanted scene while recording, press ❚❚ PAUSE, turn the JOG dial/SHUTTLE ring on the VCR to rewind the tape to the beginning of the unwanted scene, then press ❚❚ PAUSE to resume recording.
- The display appears on the TV screen won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.



To select tape speeds

When recording, select either SP or LP. LP provides recording time twice as long as SP. However, SP provides better picture quality. You can mix SP and LP on the same tape. When playing back, the VCR automatically detects the tape speed. See the table below for the maximum recording/playback time in each speed.

Tape type	Maximum recording/playback time	
	SP	LP
E-300	5 hrs.	10 hrs.
E-240	4 hrs.	8 hrs.
E-180	3 hrs.	6 hrs.
E-120	2 hrs.	4 hrs.
E-60	1 hr.	2 hrs.

Recording using the quick timer

The quick timer enables you to record for a specified period of time in intervals of 30 minutes. Once you specify the recording time, the VCR automatically stops recording. Before you begin, check that the clock is set correctly.

After you start recording, press QUICK TIMER until the desired duration appears in the display window. The TIMER REC indicator on the VCR lights up. Each press increases the recording duration in increments of 30 minutes as shown below.

→ 0:00 → 0:30 → 1:00 → ····→ 10:30 → 11:00

The recording duration decreases minute by minute to 0:00, then the VCR turns off automatically.

To stop recording

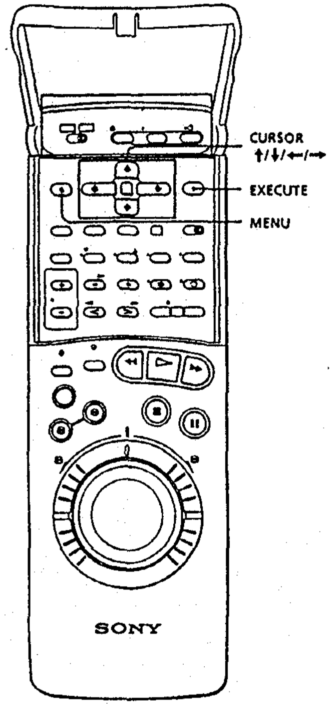
To stop quick-timer recording while the VCR is recording a programme, press ■ STOP.

To extend the recording duration while recording

Press QUICK TIMER until the desired duration appears in the display window.

Watching a TV programme while recording another

You can watch a TV programme and record another at the same time.
1 Press TV/VTR on the top right of the remote commander to turn off the VTR indicator in the display window.
2 Select the desired programme position on the TV.

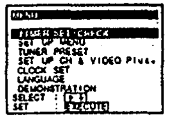


Tip
- When you set HIFI AUDIO to NICAM, the stereo or bilingual sound is recorded on the hi-fi audio track and the standard sound is recorded on the normal audio track.

Recording stereo and bilingual programmes in NICAM system

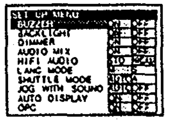
This VCR receives and records stereo and bilingual programmes based on the NICAM system. When NICAM broadcasts are received, the NICAM indicator appears in the display window; when stereo programmes are received, the STEREO indicator appears in the display window; when bilingual programmes are received, the MAIN/L indicator lights up in the display window.

1 Lift the cover of the remote commander, and press MENU.
The main MENU appears on the TV screen.



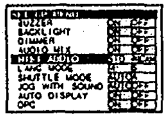
MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT : ↑↓
SET : EXECUTE

2 Press CURSOR ↑/↓ to move the cursor (▮) to SET UP MENU, then press EXECUTE.
The SET UP MENU appears.



SET UP MENU
BUZZER ON OFF
BACKLIGHT ON OFF
DIMMER ON OFF
AUDIO MIX ON OFF
HIFI AUDIO STD NICAM
LANG MODE
SHUTTLE MODE AUTO A
JOG WITH SOUND AUTO OFF
AUTO DISPLAY ON OFF
OPC ON OFF

3 Press CURSOR ↑/↓/←/→ to move the cursor (▮) to HIFI AUDIO, then highlight NICAM.



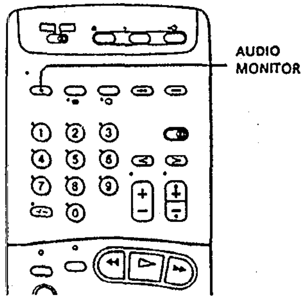
SET UP MENU
BUZZER ON OFF
BACKLIGHT ON OFF
DIMMER ON OFF
AUDIO MIX ON OFF
HIFI AUDIO STD NICAM
LANG MODE
SHUTTLE MODE AUTO A
JOG WITH SOUND AUTO OFF
AUTO DISPLAY ON OFF
OPC ON OFF

4 Press EXECUTE to store the setting.

Using the NICAM setting, NICAM broadcasts are recorded as in the following table.

Track	**Sound recorded**	
	Stereo	**Bilingual**
Hi-fi audio Left channel	Left channel	Main
Hi-fi audio Right channel	Right channel	Sub
Normal audio (monaural)	Standard (usually the mixed sound of left and right channels)	Standard (usually the main sound)

Recording TV programmes (continued)



Note
- If you set HIFI AUDIO to STD, the standard sound is recorded on both the hi-fi and normal audio tracks. (You cannot select the listening sound using AUDIO MONITOR.)

To monitor stereo and bilingual programmes while recording

Set HIFI AUDIO to NICAM. Press AUDIO MONITOR to select the desired sound.

Stereo programmes

To listen to	**Press AUDIO MONITOR until**	
	The TV screen shows	**The display window shows**
Stereo sound	"STEREO"	"STEREO"
Standard sound	No indication	No indication

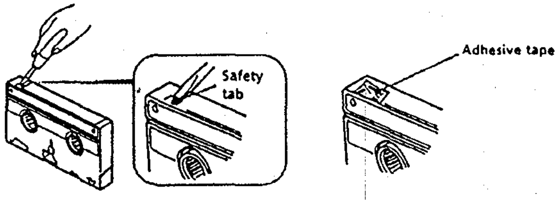
Bilingual programmes

To listen to	**Press AUDIO MONITOR until**	
	The TV screen shows	**The display window shows**
Main sound	"MAIN"	"MAIN/L"
Sub sound	"SUB"	"SUB/R"
Main and sub sounds	"MAIN/SUB"	"MAIN/L, SUB/R"
Standard sound	No indication	No indication

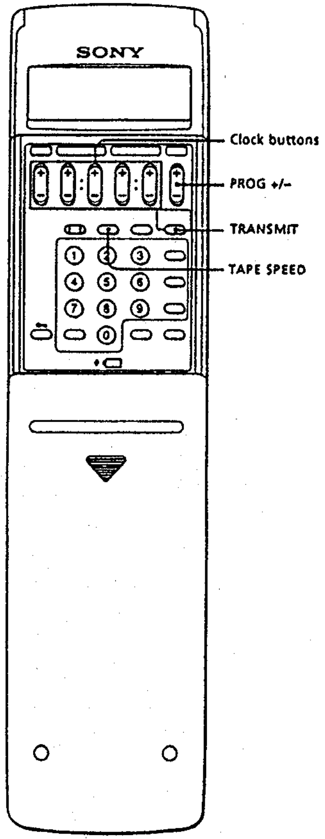
Saving a recording

Video tapes have a safety tab to protect against accidental recording. To prevent accidental erasure of a recording, break off the safety tab with a screwdriver or other tool. A tape with its safety tab removed is ejected if you try to record on it.

To record on a tape with its safety tab removed, cover the tab hole with adhesive tape.



Recording TV programmes using the timer


SONY
Clock buttons
PROG +/–
TRANSMIT
TAPE SPEED

Tip
- To record a video source from LINE IN jacks, press INPUT SELECT to display "L1", "L2", "L3" or "L4" in the "PROG" position.

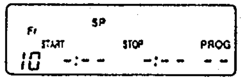
This section shows you how to let the VCR automatically start and stop recording TV programmes. You can preset up to eight programmes within a one month time frame.
For timer setting, you may use either the remote commander display (this page) or the menu on the TV screen (page 33).

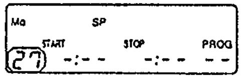
Setting the timer using the remote commander display

Before you start...
- Check that the clock of the remote commander and the VCR's clock are set correctly.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

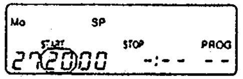
1 **Slide down the back cover of the remote commander.**

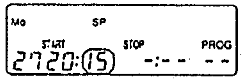
2 **Set the date to start recording by pressing DAY D +/–.**
The day of the week is set automatically.
To record the same programme every day or the same day once a week, see "Daily/weekly recording" on page 32.


Fr
SP
START
STOP
PROG
10 –:– – –:– – – –

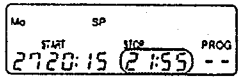

Mo
SP
START
STOP
PROG
27 –:– – –:– – – –

3 **Set the time to start recording.**
1 Press START H +/– to set the hour when you want to start recording.
2 Press START M +/– to set the minutes.

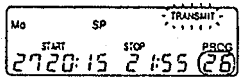

Mo
SP
START
STOP
PROG
27 20:00 –:– – – –


Mo
SP
START
STOP
PROG
27 20:15 –:– – – –

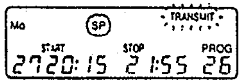
4 **Set the time to stop recording by pressing STOP H +/– and M +/–.**


Mo
SP
START
STOP
PROG
27 20:15 21:55 – –

5 **Select the programme position by pressing PROG +/–.**


Mo
SP
TRANSMIT
START
STOP
PROG
27 20:15 21:55 26

6 **Select the tape speed, SP or LP, by pressing TAPE SPEED.**
See "To select tape speeds" on page 28.

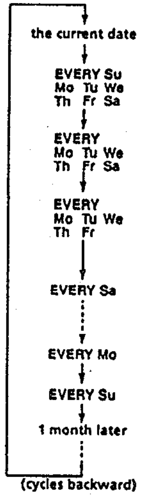

Mo
SP
TRANSMIT
START
STOP
PROG
27 20:15 21:55 26

(continued)

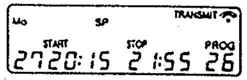
Recording TV programmes using the timer (continued)

Tips
- To change or correct the setting before transmitting it, press the button for the item you want to change.
- To ensure the timer recording regardless of broadcast delays, early starts, etc., use the PDC function. See page 35.

Note
- If the power is interrupted for more than one hour while the VCR is standing by for recording, the timer settings are cleared. Reset the timer.


the current date
EVERY Su Mo Tu We Th Fr Sa
EVERY Mo Tu We Th Fr Sa
EVERY Mo Tu We Th Fr
EVERY Sa
EVERY Mo
EVERY Su
1 month later
(cycles backward)

7 **Point the remote commander at the VCR and press TRANSMIT to store the setting in the VCR's memory.**
A beep sound indicates that the programme has been transmitted to the VCR. The TIMER REC indicator on the VCR lights up and the VCR stands by for recording.
To preset another timer setting, repeat steps 2 to 7.
The VCR automatically turns on and starts recording at the preset start time, and turns off at the preset stop time.

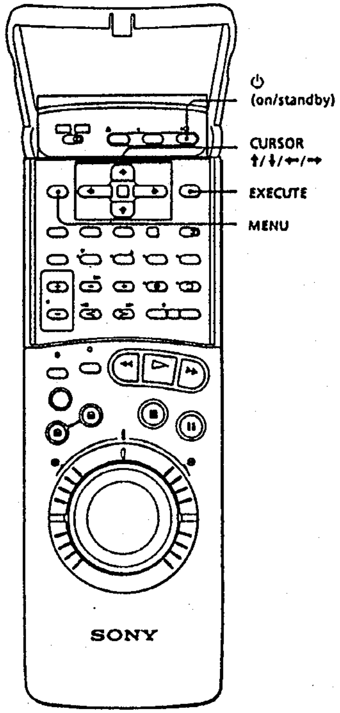

Mo
SP
TRANSMIT
START
STOP
PROG
27 20:15 21:55 26

To stop recording
To stop while the VCR is recording a programme, press ■ STOP.

Daily/weekly recording

Daily recording records the same programme every day of the week; weekly recording records the same programme on the same day, every week.

When you set the date to start recording in step 2 above, press the D – button until the desired day appears. Each time you press the button, the indication changes as shown on the left.


⏻ (on/standby)
CURSOR ↑/↓/←/→
EXECUTE
MENU
SONY

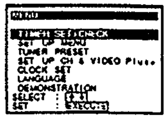
Setting the timer using the menu

Before you start...

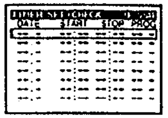
- Check that the VCR's clock is set correctly.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and tune in to the VCR.

---

1 **Lift the cover of the remote commander and press MENU.**

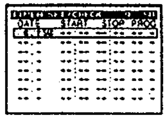

MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT : ↑↓
SET : EXECUTE

2 **Press CURSOR ↑/↓ to move the cursor (▮) to TIMER SET/CHECK, then press EXECUTE.**
The TIMER SET/CHECK menu appears.


TIMER SET/CHECK
DATE
START
STOP
PROG

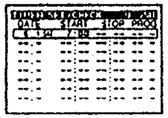
3 **Set the date to start recording.**

1 Press CURSOR → to highlight the date.
Make sure today's date is displayed. If it isn't, adjust the clock.
2 Press CURSOR ↑/↓ to set the date.
The day of the week is set automatically.

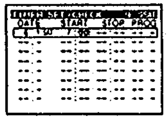

TIMER SET/CHECK
DATE
START
STOP
PROG

4 **Set the time to start recording.**

1 Press CURSOR → to highlight the hour under "START," then press CURSOR ↑/↓ to set the hour.
2 Press CURSOR → to highlight the minutes under "START," then press CURSOR ↑/↓ to set the minutes.


TIMER SET/CHECK
DATE
START
STOP
PROG

5 **Press CURSOR →, then set the time to stop recording in the same way.**


TIMER SET/CHECK
DATE
START
STOP
PROG

(continued)

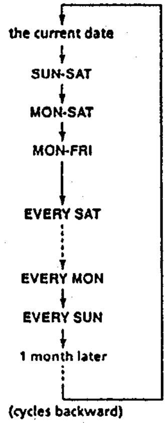
Recording TV programmes using the timer (continued)

Tips

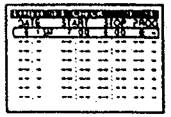
- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To record a video source from LINE IN jacks, press INPUT SELECT to display "LINE1", "LINE2" "LINE3" or "LINE4" in the "PROG" position.
- To set the recording tape speed, you can also use TAPE SPEED.
- To change the digits during setting, press CURSOR ← to return to the item to be changed, and select the digits using CURSOR ↑/↓.
- To ensure the timer recording regardless of broadcast delays, early starts, etc., use the VPS/PDC function. See page 35.

Note

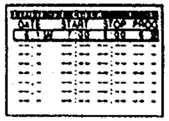
- If the power is interrupted for more than one hour while the VCR is standing by for recording, the timer settings are cleared. Reset the timer.


the current date
SUN-SAT
MON-SAT
MON-FRI
EVERY SAT
EVERY MON
EVERY SUN
1 month later
(cycles backward)

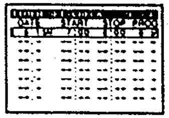
6 **Press CURSOR →, then select the programme position by pressing CURSOR ↑/↓.**


DATE
START
STOP
PROG

7 **Press CURSOR →, then select the tape speed, SP or LP, by pressing CURSOR ↑/↓.**
See "To select tape speeds" on page 28.


DATE
START
STOP
PROG

8 **To confirm your programme, press CURSOR →.**
The cursor (▮) appears in the leftmost column.
To preset another timer setting, move the cursor to the next line using CURSOR ↓, and repeat steps 3 to 8.


DATE
START
STOP
PROG

9 **After making the desired timer settings, press EXECUTE.**

10 **Press ⏻ (on/standby) to turn off the VCR.**
The TIMER REC indicator on the VCR lights up. The VCR turns off automatically and enters timer recording standby mode.
The VCR automatically turns on and starts recording at the preset start time, and turns off at the preset stop time.

To stop recording
To stop while the VCR is recording a programme, press ■ STOP.

Daily/weekly recording

Daily recording records the same programme every day of the week; weekly recording records the same programme on the same day, every week.

When you set the date to start recording in step 3 above, press CURSOR ↓ until the desired day appears. Each time you press the button, the indication changes as shown on the left.

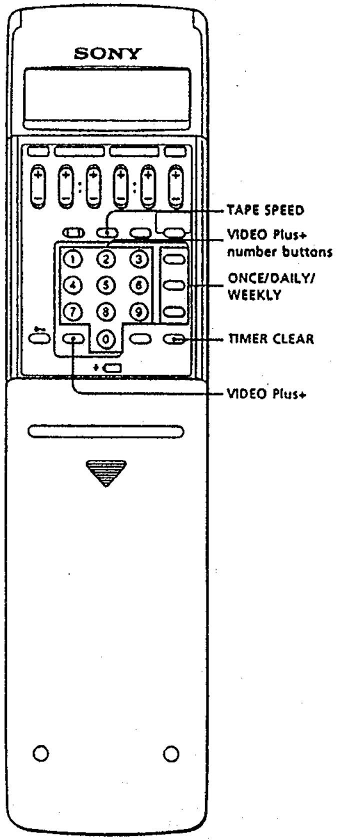
Notes
- If recording times overlap due to a VPS/PDC timer shift, the programme that was broadcast first has priority. The second programme will begin to record only when the first programme has finished.
- If the VPS/PDC signal is too weak or the broadcasting station failed to transmit VPS/PDC signals, the VCR will record the programme without using the VPS/PDC function even if the VPS/PDC indicator is lit on the VCR.
- When the VPS/PDC function is on, "PDC" appears on the TV screen.

Timer recording with VPS/PDC signals

The broadcast system transmits VPS (Video Programme System) signals or PDC (Programme Delivery Control) signals with its TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delays, early starts or broadcast interruptions on that day. When setting the timer, make sure to enter the start time exactly as indicated in the TV programme guide, otherwise the VPS/PDC function will not work.

1 If the TIMER REC indicator on the VCR is lit, press ⏻ (on/standby) to release the VCR from standby and turn it on.
2 While the VCR is turned on, press VPS/PDC.
The VPS/PDC indicator lights up on the VCR.
3 If you turned off the TIMER REC indicator in step **1**, press ⏻ (on/standby).
The TIMER REC indicator lights up and the VCR returns to recording standby. Once you switch on the VPS/PDC function, it works on all timer settings that are set to programmes with VPS/PDC signals.

Recording TV programmes using VIDEO Plus+



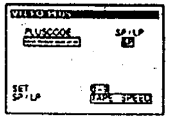
Note
- The programme number buttons on the front panel of the remote commander don't work while the remote commander is in the VIDEO Plus+ mode.

The section shows you another way of timer recording: recording using VIDEO Plus+. This allows you to record TV programmes more easily. Just enter the programme's "PlusCode," and the VCR will automatically record the programme. You can preset up to eight programmes within a one month time frame. To take advantage of this feature, you must first set up your VCR and assign programme positions to the various guide channels. For details, see "Setting up VIDEO Plus+ manually" on page 21.

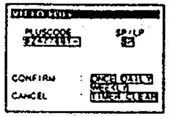
Before you start...
- Check that the VCR's clock is set correctly.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and tune in to the VCR.

1 **Slide down the back cover of the remote commander.**

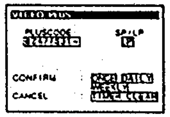
2 **Press VIDEO Plus+.**
The remote commander display enters the VIDEO Plus+ mode and the VIDEO PLUS menu appears on the TV screen.



3 **Use the VIDEO Plus+ number buttons to enter the desired programme's PlusCode.**
If you made a mistake, press TIMER CLEAR and enter the correct number.



4 **Select the tape speed, SP or LP, by pressing TAPE SPEED.**

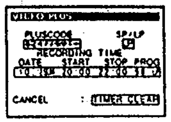


Tips
- To exit from the VIDEO Plus+ mode, press VIDEO Plus+ before pressing ONCE, DAILY or WEEKLY in step 5.
- The remote commander exits from the VIDEO Plus+ mode automatically in about 12 seconds after ONCE, DAILY or WEEKLY was pressed.

Notes
- You cannot set VIDEO Plus+ in the following cases:
  - When the VCR is turned off.
  - While recording using the timer or quick timer.
- The timer will not accept settings in the following cases:
  - When you select DAILY for a Saturday or Sunday programme.
  - When you select DAILY or WEEKLY for a programme more than seven days ahead.
  - When you enter the PlusCode of a programme that has already ended.
- If the VCR dose not accept the setting, check the PlusCode again and change it repeating from step 2.

5 **Press ONCE, DAILY or WEEKLY according to the following table.**

To record the programme	Press
Only once	ONCE
Monday to Friday at the same scheduled time	DAILY
Every week at the same scheduled time	WEEKLY



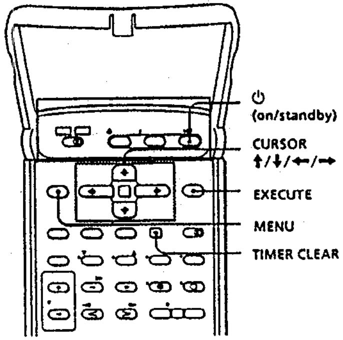
The recording information appears on the TV screen: date, programme start and stop times, programme position number and tape speed.
Check that the information is correct. If it is not, press TIMER CLEAR to cancel the setting.
If you set the wrong PlusCode, the VCR sounds short beeps.
To preset another timer setting, repeat steps 2 to 5.

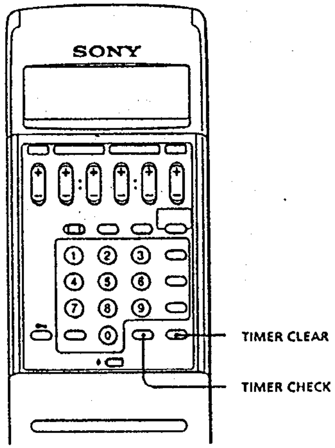
6 **Press ⏻ (on/standby) to turn off the VCR.**
The TIMER REC indicator on the VCR lights up. The VCR turns off automatically, and enters timer recording standby mode.
The VCR automatically turns on, records the programme and turns off.

To stop recording
To stop while the VCR recording a programme, press ■ STOP.

To record satellite broadcasts
If you connect the satellite tuner and the VCR, you can record satellite programmes.
1 Turn on the satellite tuner.
2 On the satellite tuner, select the satellite programme for which you wish to make a timer setting.
3 Repeat the steps described above.
4 Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

Checking/changing/cancelling timer settings

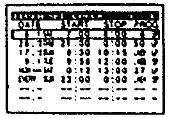




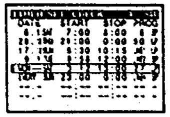
This section shows you how to check, change and cancel the timer settings after you've stored them in the VCR.

Before you start...
- Turn on your TV and tune in to the VCR.

1 **Press ⏻ (on/standby) to turn on the VCR.**



2 **Press TIMER CHECK to display the TIMER SET/CHECK menu on the TV screen.**
You may press MENU, CURSOR ↑/↓ and EXECUTE to select TIMER SET/CHECK menu.



3 **Check the timer settings in the list.**
- If you don't want to change or cancel the settings, press ⏻ (on/standby) to return to recording standby.
- If you want to change or cancel the settings, press TIMER CHECK to move the cursor (▮) to the setting you want to change or cancel.

4 **Change or cancel the timer setting:**
- To change the setting, press CURSOR ←/→ to highlight the item you want to change, and reset it using CURSOR ↑/↓. Then, press CURSOR → repeatedly until the cursor appears in the leftmost column.
- To cancel the setting, press TIMER CLEAR.

5 **Press EXECUTE.**
The VCR returns to the original screen. If there are any timer settings left in the TIMER SET/CHECK menu, press ⏻ (on/standby) to return to recording standby.

To check the timer settings during timer recording
Press TIMER CHECK. After checking, press EXECUTE to turn off the display.

Additional instructions about timer recording

This section gives additional information about timer recording which you need after you have stored timer settings in the VCR.

To use the VCR while recording

You can do the following tasks during timer recording.

To	Press
Reset the counter to "0H00M00S"	COUNTER RESET
Display tape information on the TV screen	DISPLAY
Check the timer settings	TIMER CHECK
Watch another TV programme	TV/VTR (See "Watching a TV programme while recording another" on page 28.)

Using the VCR before timer recording begins

Press ⏻ (on/standby). The TIMER REC indicator on the VCR goes off and the VCR is ready for use.
After using the VCR, press ⏻ (on/standby) again to turn on the TIMER REC indicator on the VCR. Remember to reset the VCR to stand by for recording before the time you've set the VCR to start recording, or the timer setting will be cancelled.

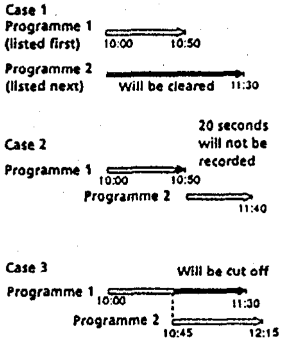
When the timer settings overlap

The VCR will not record overlapping programmes. If any of your timer settings overlap, change the settings.

Case 1: If you preset two programmes to start recording at the same time...
The programme listed first in the TIMER SET/CHECK menu has priority over the other programmes. The timer settings of lower priority programmes will be erased from the list when the first programme begins recording.

Case 2: If you preset programme 2 to start recording at the same time you preset programme 1 to finish recording...
The last 20 seconds of programme 1 will not be recorded because the VCR will enter recording pause for programme 2 before programme 1 is finished.

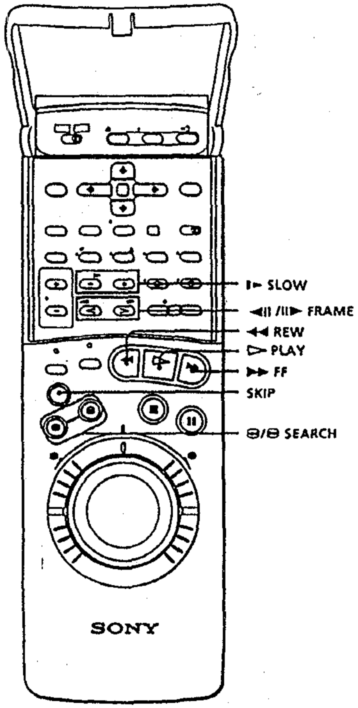
Case 3: If you preset programme 2 to start recording before programme 1 is finished recording...
Programme 2 will start recording before programme 1 has finished.



Note

- The priority of the overlapping programmes may be different from the above cases if the VPS or PDC function is activated. See "Timer recording with VPS/PDC signals" on page 35.

Playing/searching at various speeds



Tip

- Adjust the picture using ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST if:
  - Streaks appear while playing in slow motion.
  - Bands appear on the top or bottom while pausing.
  - The picture shakes while pausing.

Note

- If you use these functions in the LP mode, there may be no colour or the screen may be dim.

You can play back a tape at various speeds: high-speed, slow motion, frame by frame and so on. These options are also useful for searching for a specific point during playback. The sound is muted during these operations.

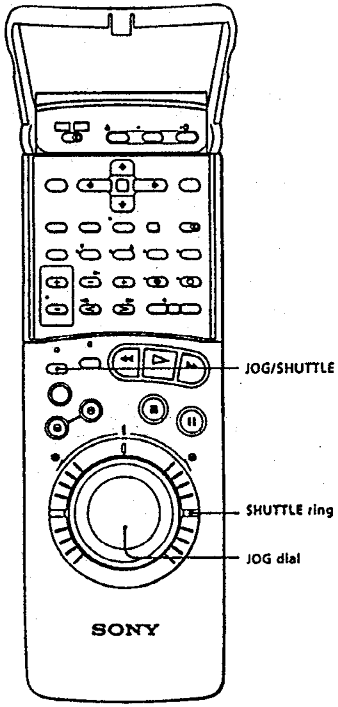
Using the tape transport buttons

Playback options	Operation	To resume normal playback
Fast-forwarding/ Rewinding	Press ►►FF or to ◄◄REW .	Press ▷ PLAY.
Viewing the picture during fast-forward or rewind	During fast-forward, keep pressing ►►FF. During rewind, keep pressing ◄◄REW.	To return to the previous mode, release the button.
Locking in a high-speed picture	During playback or pause, press ⊖ SEARCH or ⊕ SEARCH.	Press ▷ PLAY.
Locking in a slow-motion picture	During playback or pause, press I► SLOW –/+. You can increase the playback speed with the + button and decrease the speed with the – button. To change direction, press ◄II FRAME (backward) or II►FRAME (forward).	Press ▷ PLAY.
Playing frame by frame	During pause, press II► FRAME to advance the picture one frame or ◄II FRAME to reverse the picture one frame. Keep pressing the button to advance or reverse one frame every one second.	Press ▷ PLAY or II PAUSE.
Playing in reverse	During playback, press ◄II FRAME.	Press ▷ PLAY.
Skipping a scene	During playback, press SKIP. Pressing once skips about 30 seconds.	The VCR automatically resumes normal playback.
Rewind and restart play	During stop, press ▷ PLAY on the VCR while pressing the ◄◄ REW button on the VCR .	—

Using the JOG dial/SHUTTLE ring

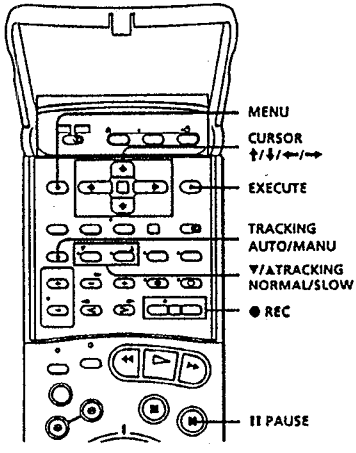
To use the JOG dial/SHUTTLE ring on the remote commander for playing/searching at various speeds, first press JOG/SHUTTLE on the remote commander to turn on its indicator. After using, press JOG/SHUTTLE again to turn off the indicator.

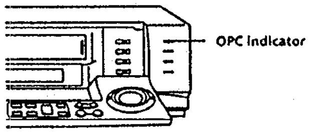
Note
- When JOG or SHUTTLE is in use, no tape transport buttons function.



Playback options	Operation	To resume playback pause
Playing at various speeds:	During playback pause, turn the SHUTTLE ring right or left to:	Release the ring
One-fifth the normal speed	1/5	
The normal speed	1	
Twice the normal speed	×2	
High speed	⊖ or ⊖	
Playing at the speed at which you turn the JOG dial	During playback pause, turn the JOG dial to right or left. The speed changes from frame-by-frame to 1/5 to normal as you turn the dial faster.	Release the dial.

Adjusting the picture





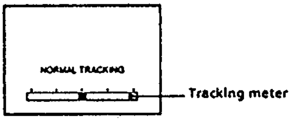
Notes
- Tapes recorded using the OPC function are played back normally on VCRs that do not have the OPC function.
- Press II PAUSE to start recording after the OPC indicator stops flashing. If you start recording before the OPC indicator stops flashing, the OPC function is cancelled.

The VCR automatically adjusts the picture and sound for the best possible playback or recording. If, however, you find the automatic adjustment unsatisfactory, you can adjust the picture manually.

Adjusting the tracking

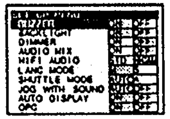
Though the VCR automatically adjusts the tracking when playing a tape (the AUTO TRACKING indicator flashes in the display window, then lights steadily), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking condition.

Press ▼/▲ TRACKING NORMAL/SLOW to display the tracking meter. The distortion should disappear as you press one of the two buttons. If you cannot get a clear picture with manual adjustment, press TRACKING AUTO/MANU to return to automatic adjustment.



About Optimum Picture Control (OPC)

Optimum Picture Control (OPC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you leave OPC ON on the SET UP MENU screen (with the OPC indicator lit on the VCR).



To use OPC during playback
The OPC function automatically works on all types of tapes, including rental tapes. You can play a tape using the OPC function even if the tape was not recorded with it.

To use OPC while recording
Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the OPC function (the OPC indicator flashes rapidly). This adjustment is retained until the tape is ejected. There is a short delay before the VCR actually starts recording while the VCR analyzes the tape.
If you want to start recording precisely the first time you record, set the VCR to recording pause mode (the OPC indicator flashes slowly) and press ● REC to let the VCR analyze the tape. When the OPC indicator stops flashing, press II PAUSE to start recording. Recording begins immediately.

To deactivate the OPC
Press MENU and select SET UP MENU, then set OPC to OFF. The OPC indicator goes off.

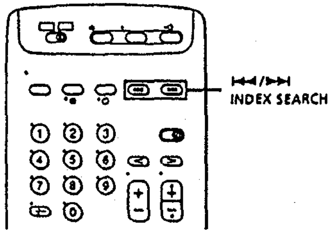
Searching using the index function

Note
- The index signal is not marked automatically when recording starts from recording pause. However, you can mark an index signal if you change the channel during recording pause.

The VCR automatically marks an index signal at the point where recording starts (with the exception of when you start recording from recording pause). Use this as a reference to find the beginning of the recording. Since the index number indicates the relative position from the current position, specify how many index signals ahead or behind the specific index signal is from the current position.

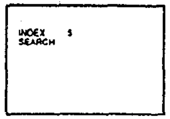
Locating an index

1 **Open the drop down panel and insert an indexed tape into the VCR.**



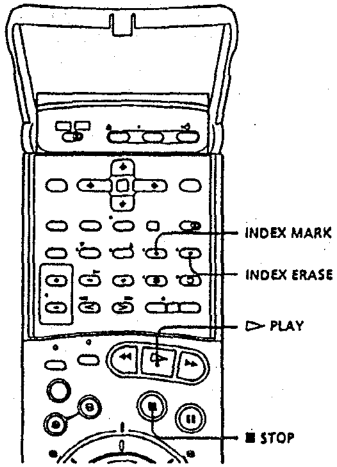
2 **Press ⏮/⏭ INDEX SEARCH repeatedly until the index number you want appears on the TV screen:**
- To locate succeeding programmes, press ⏭ INDEX SEARCH.
- To locate preceding programmes, press ⏮ INDEX SEARCH.

The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.



Marking index signals

You can mark an index signal anywhere on a tape, so that you can easily find the specific point later on. Press INDEX MARK while in recording or playback mode.



Erasing index signals

You can remove any unwanted index signals using this function.

1 **Press ⏮/⏭ INDEX SEARCH while in stop or playback mode.**
The VCR rewinds or fast-forwards the tape automatically, and playback starts when the index number indicated on the TV screen reaches "0".

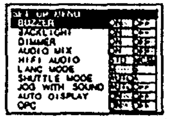
2 **Press INDEX ERASE during 10-second preview for the index you want to erase.**
To stop erasing index signals, press ▷ PLAY or ■ STOP.

INDEX
ERASE

Note
- You can't mark or erase index signals on a tape with its safety tab removed.

Looking at menu options

The SET UP MENU provides you with various options to set up and customize your VCR. See the table below for the available menu choices. Initial settings are indicated in bold letters.



To change the setting
Press CURSOR ↑/↓ to highlight the menu option and change the setting using CURSOR ←/→.

Menu choices

Menu option	Set this option to
BUZZER	• **ON** to output a beep sound when all illogical operation is made. • OFF to deactivate it.
BACKLIGHT	• **ON** to backlight the display on the VCR. • OFF to turn it off.
DIMMER	• ON to dim the VCR display. • **OFF** to brighten it.
AUDIO MIX	• ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button becomes inoperable. • **OFF** to select the sound using the AUDIO MONITOR button. For details, see page 26 and 53.
HIFI AUDIO	• STD to record standard sound on a hi-fi audio track. • **NICAM** to record NICAM broadcasts on a hi-fi audio track. For details, see page 29.
LANC MODE	• **M** to control another VCR with this VCR using the ⏏LANC jack. • S to control this VCR with another VCR.
SHUTTLE MODE	• **AUTO** to use this remote commander with a VCR that has a JOG/SHUTTLE function. • A to use it with a VCR that doesn't have a JOG/SHUTTLE function.
JOG WITH SOUND	• **AUTO** to listen to the sound while operating the JOG dial/SHUTTLE ring on the VCR in the edit standby mode. • OFF to mute the sound while operating the JOG dial/SHUTTLE ring on the VCR in the edit standby mode.
AUTO DISPLAY	• **ON** to display the tape operation mode, programme number, etc. on the TV screen each time you operate the VCR. • OFF to display the information on the screen when you press the DISPLAY button.
OPC	• **ON** to activate the OPC (Optimum Picture Control). • OFF to deactivate it. For details, see page 42.

Tip
- See "How sound is recorded on a video tape" on page 26.

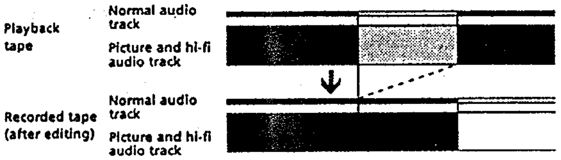
Note
- The JOG WITH SOUND option is not effective for the JOG dial/SHUTTLE ring on the remote commander.

Editing methods

This section introduces you to various ways of editing tape recordings. For simpler operation and more accurate editing, connecting a VCR equipped with a LANC jack is recommended. See "Hooking up to a VCR with a LANC cable" on page 47. Note that for programme assemble editing, this connection is a must. If your VCR doesn't have a LANC jack, see "Hooking up to a VCR without a LANC cable" on page 57.

Basic editing

Besides making a copy of a tape, you can also cut out unwanted scenes.

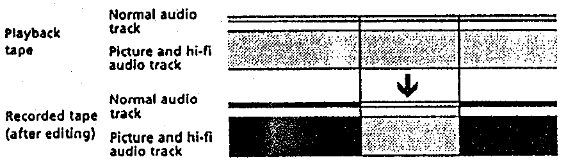

Playback tape
Normal audio track
Picture and hi-fi audio track
Recorded tape (after editing)
Normal audio track
Picture and hi-fi audio track

Insert editing

You can replace an existing scene with material from another recording. There are three kinds of insert editing:

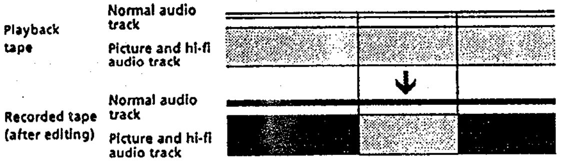
A/V insert

Records over the existing picture and sound. The sound on both the hi-fi and normal audio tracks is replaced.


Playback tape
Normal audio track
Picture and hi-fi audio track
Recorded tape (after editing)
Normal audio track
Picture and hi-fi audio track

Video insert

Records over the existing picture. The sound on the hi-fi track is also replaced but the normal audio track remains unchanged.

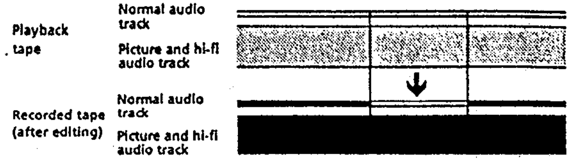

Playback tape
Normal audio track
Picture and hi-fi audio track
Recorded tape (after editing)
Normal audio track
Picture and hi-fi audio track

Tips

- To select between the hi-fi and normal audio track, press AUDIO MONITOR.
- To hear both audio tracks at the same time, set AUDIO MIX to ON in the SET UP MENU.
- For further information on audio tracks, see "How sound is recorded on a video tape" on page 26.

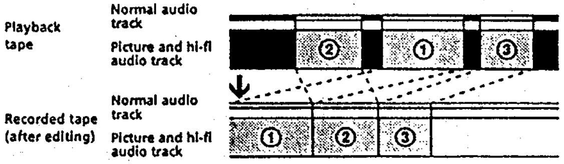
Audio insert

Records over the normal (monoaural) audio track. The original hi-fi track and picture remain unchanged.
You can also use this feature to add commentary and background music to a tape that you have recorded with a camcorder (see "Audio dubbing for commentary and background music" on page 63).


Playback tape
Normal audio track
Picture and hi-fi audio track
Recorded tape (after editing)
Normal audio track
Picture and hi-fi audio track

Programme assemble editing

Enables you to select various scenes from a source tape and record them in any order you choose.
To use this function, you must connect to a VCR equipped with a LANC jack.


Playback tape
Normal audio track
Picture and hi-fi audio track
②
①
③
Recorded tape (after editing)
Normal audio track
Picture and hi-fi audio track
①
②
③

Hooking up to a VCR with a LANC cable

If the other VCR is equipped with a LANC jack, connect the VCRs with the LANC cable. This additional connection lets you control the other VCR from this VCR and synchronize the starting and stopping of the VCRs. This greatly simplifies editing. If the other VCR does not have a LANC jack, see page 57 for instructions on connections.

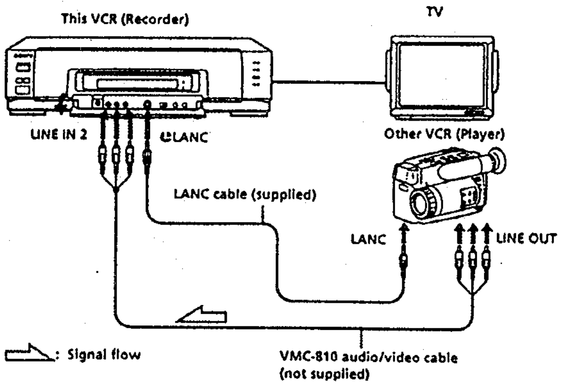
Tip

- Jacks indicated as CONTROL L or REMOTE have the same function as the LANC jack. To connect to a CONTROL L or REMOTE jack, use the appropriate cable.

Notes

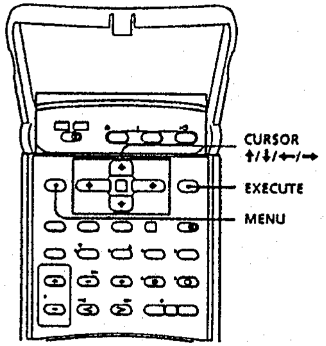
- Make sure to connect the plugs to jacks of the same colour.
- If you connect both the LINE IN and LINE OUT jacks of this VCR to the other VCR , be sure to select the input correctly to prevent a humming noise.
- If the playback VCR is a monaural type and you use LINE IN 2 on the front of this VCR, connect to the AUDIO L (white) jack.

How to hook up to record on this VCR

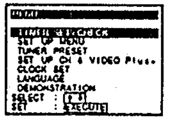


Setting the LANC mode and SHUTTLE mode

The LANC mode setting determines which VCR controls the other. Set the LANC mode so that the recording VCR becomes the controlling VCR: set the recording VCR to LANC mode M and the playback VCR to LANC mode S. Sony brand camcorders should be set to LANC mode S. You also need to set the SHUTTLE mode depending on whether the other VCR has a JOG/SHUTTLE function or not.

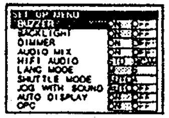


1 Lift the cover of the remote commander and press MENU.
The main MENU appears on the TV screen.



SET UP MENU
TUNER PRESET
SET UP CH & VIDEO Plus+
CLOCK SET
LANGUAGE
DEMONSTRATION
SELECT : ↑↓
SET : EXECUTE

2 Press CURSOR ↑/↓/←/→ to move the cursor (▌) to SET UP MENU, then press EXECUTE.
The SET UP MENU appears.

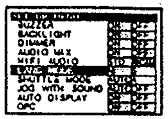


SET UP MENU
BUZZER
BACKLIGHT
DIMMER
AUDIO MIX
HIFI AUDIO
LANC MODE
SHUTTLE MODE
JOG WITH SOUND
AUTO DISPLAY
OPC

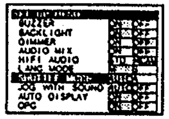
(continued)

Hooking up to a VCR with a LANC cable (continued)

3 Press CURSOR ↑/↓/←/→ to move the cursor (▌) to LANC MODE, then highlight M.



4 Press CURSOR ↑/↓/←/→ to move the cursor (▌) to SHUTTLE MODE, then highlight AUTO or A.
- Set SHUTTLE MODE to AUTO if the other VCR has a JOG/SHUTTLE function.
- Set SHUTTLE MODE to A if other VCR does not have a JOG/SHUTTLE function.



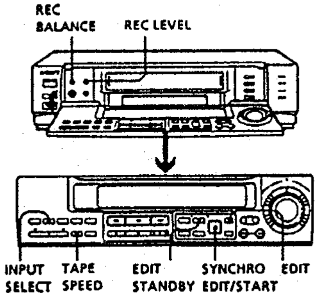
5 Press EXECUTE to store the setting.

6 On the playback VCR, set the LANC mode to S.

About ⒸLANC

LANC stands for Local Application Control Bus System. The ⒸLANC jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as jacks indicated as CONTROL L or REMOTE.

Basic editing with a LANC connection



Making a copy of a tape

Before you start editing...

- Follow the instructions on page 47 to hook up your VCRs.
- Turn on your TV and tune in to the VCR.

On the playback VCR

- Switch on the EDIT mode if available.
- Turn off on-screen displays.
- When recording from a stereo/bilingual source tape, set the playback VCR to output both main and sub channels.

On this (recording) VCR

- Press EDIT to display "EDIT" in the display window.
- Press INPUT SELECT to display the addressed input in the display window.
- Set the REC LEVEL control on the VCR to $\boxed{5}$ and the REC BALANCE control on the VCR to the centre.
- Press TAPE SPEED to select the recording tape speed (SP/LP).

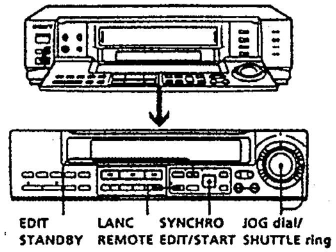
1 **Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point where you want to start playback for editing.**

2 **Insert a blank tape into this (recording) VCR and search for the point you want to start recording.**

3 **Press EDIT STANDBY on this VCR.**
This (recording) VCR enters recording pause and the other (playback) VCR enters playback pause.

4 **Press SYNCHRO EDIT/START to start editing.**

5 **To finish editing, press EDIT STANDBY.**
Both VCRs stop.



Tip

- You can use the tape transport buttons instead of the JOG/SHUTTLE to find a point on the tape. In this case, you need to press ⏸ PAUSE to set the VCR to pause after you find the point.

Note

- If the source tape is in poor condition, this VCR may display a blue screen on the TV for a moment.

Cutting out unwanted scenes

You can edit out unnecessary scenes while making a copy of a tape.

Before you start editing...
Prepare the playback VCR and this (recording) VCR following the instructions for "Making a copy of a tape" on page 49.

1 **Follow steps1 to 4 on page 49 to start editing.**

2 **When you come to a section that you want to leave out, press SYNCHRO EDIT/START on this VCR.**
Both VCRs are set to pause.

3 **Press LANC REMOTE on this VCR so that the indicator lights up.**
Switching on LANC REMOTE allows you to control the other (playback) VCR from this VCR.

4 **Turn the JOG dial or SHUTTLE ring on this VCR to find the next starting point on the source tape.**
When you release the JOG dial/SHUTTLE ring, the playback VCR is set to playback pause automatically.
For details how to use the JOG dial and SHUTTLE ring, see page 41.
- If part of the unwanted scene was recorded in step 2, go to the next step. If not, skip to step 6.

5 **Press LANC REMOTE to turn off the indicator so that you resume control of this VCR. Then turn the JOG dial or SHUTTLE ring to find the beginning of the unwanted scene.**

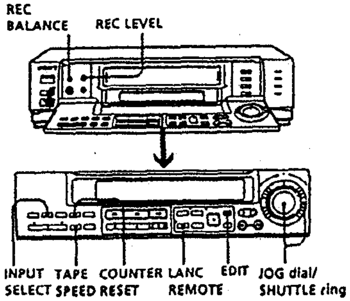
6 **Press SYNCHRO EDIT/START to resume editing.**

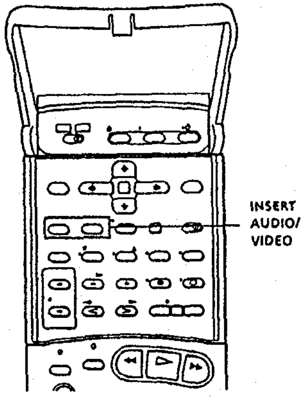
7 **To cut out other scenes, repeat steps 2 to 5.**

8 **To finish editing, press EDIT STANDBY.**
Both VCRs stop.

Insert editing with a LANC connection

Note
- The normal audio sound is monaural.





You can replace unwanted scenes with other scenes by recording pictures and/or sound over the prerecorded tape.
There are three kinds of insert editing:
- A/V insert — all the original video, hi-fi sound, and the normal audio sound are replaced.
- Video insert — the original video and hi-fi sound are replaced. The original monaural sound is left intact.
- Audio insert — only the original normal audio sound is retained. The original video and hi-fi sound are left intact.

For adding commentary or/and background music using the audio insert function, see "Audio dubbing for commentary and background music" on page 62.

Before you start editing...
- Follow the instructions on page 47 to hook up your VCRs.
- Turn on your TV and tune in to the VCR.

On the playback VCR
- Switch on the EDIT mode if available.
- Turn off on-screen displays.
- When recording a stereo/bilingual source tape, set the playback VCR to output both main and sub channels.

On this (recording) VCR
- Press EDIT to display "EDIT" in the display window.
- Press INPUT SELECT to display the addressed input in the display window.
- Set the REC LEVEL control on the VCR to $\boxed{5}$ and the REC BALANCE control on the VCR to the centre.
- Press TAPE SPEED to select the recording tape speed of the prerecorded tape.

1 **Insert a source tape with its safety tab removed into the other (playback) VCR and insert the prerecorded tape into this (recording) VCR.**

2 **Press LANC REMOTE on this VCR so that the indicator lights up.**
Switching on LANC REMOTE allows you to control the other (playback) VCR from this VCR.

3 **Press ▷ PLAY and II PAUSE on the other (playback) VCR, then turn the JOG dial or SHUTTLE ring on this VCR to find the starting point of the source tape for playback.**
When you release the JOG dial/SHUTTLE ring, the other (playback) VCR is set to playback pause automatically.
For details on the JOG dial and the SHUTTLE ring, see page 41.

(continued)

Tip
- See "How sound is recorded on a video tape" on page 26.

Note
- You must be in playback pause mode before pressing an INSERT button. (If you are in recording pause mode, you cannot use the insert features.)

4 **Press LANC REMOTE on this VCR to turn off the indicator so that you resume control of this VCR. Press ▷ PLAY and II PAUSE, then turn the JOG dial or SHUTTLE ring to find the end of the section to be recorded over.**
When you release the JOG/SHUTTLE, this VCR is set to playback pause automatically.

5 **Press COUNTER RESET on this VCR to reset the counter to "0H00M00S."**

6 **Turn the JOG dial or SHUTTLE ring to find the beginning of the section to be recorded over.**
When you release the JOG/SHUTTLE, this VCR is set to playback pause automatically.

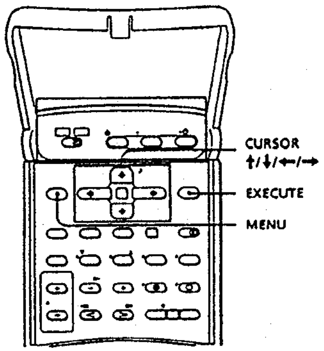
7 **Press the INSERT buttons according to the following:**

For	Press	So that
A/V insert	INSERT AUDIO, then INSERT VIDEO	the AUDIO INSERT and VIDEO INSERT indicators on the VCR light up and "AV INS" appears on the TV screen.
Video insert	INSERT VIDEO	the VIDEO INSERT indicator on the VCR lights up and "V INS" appears on the TV screen.
Audio insert	INSERT AUDIO	the AUDIO INSERT indicator on the VCR lights up and "A INS" appears on the TV screen.

8 **Press EDIT STANDBY.**
The indicator lights up. This (recording) VCR enters recording pause and the other (playback) VCR enters playback pause.

9 **Press SYNCHRO EDIT/START to start editing.**

To stop editing
Press EDIT STANDBY. Both VCRs stop.

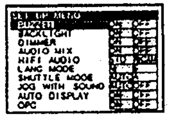


Note
- If AUDIO MIX remains ON, the AUDIO MONITOR button remains inoperative.

Listening to both audio tracks during playback

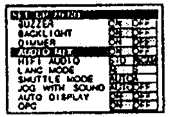
When playing an audio-inserted tape, you have a choice of listening to either the prerecorded hi-fi audio or the inserted normal audio sounds using the AUDIO MONITOR button. To listen to the sounds recorded on the hi-fi audio and normal audio tracks at the same time, use the SET UP MENU.

1 Press MENU and select SET UP MENU.



SET UP MENU
BUZZER ON OFF
BACKLIGHT ON OFF
DIMMER ON OFF
AUDIO MIX ON OFF
HIFI AUDIO STD NORM
LANC MODE 1 2
SHUTTLE MODE AUTO A
JOG WITH SOUND AUTO OFF
AUTO DISPLAY ON OFF
OPC ON OFF

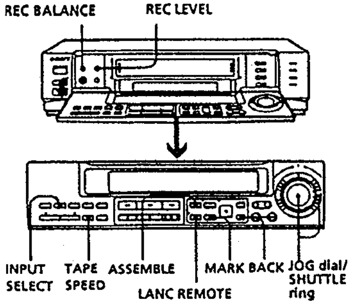
2 Set AUDIO MIX to ON using the CURSOR ↑/↓/←/→ buttons.
The AUDIO MONITOR button becomes inoperative, and the sound you hear is mixed.



SET UP MENU
BUZZER ON OFF
BACKLIGHT ON OFF
DIMMER ON OFF
AUDIO MIX ON OFF
HIFI AUDIO STD NORM
LANC MODE 1 2
SHUTTLE MODE AUTO A
JOG WITH SOUND AUTO OFF
AUTO DISPLAY ON OFF
OPC ON OFF

3 Press EXECUTE to store the setting.
After playing the audio-inserted tape, reset AUDIO MIX to OFF.

Programme assemble editing



Note
- When the other (playback) VCR does not have the RC-Time Code function, find the IN and OUT points using the time counter.

With this function you can select random scenes from one tape and assemble them into a continuous sequence on another tape. You can edit up to twelve different scenes at a time.
If you use a VCR that features the RC-Time Code function, this function allows you to perform more precise editing in unit of frames.

Operation (When recording on this VCR)

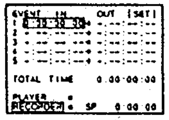
Before you start editing...
- Follow the instructions on page 47 to hook up your VCRs.
- Turn on your TV and tune in to the VCR.

On the playback VCR
- Display the Time Code in the display window if this feature is available.
- Switch on the EDIT mode if available.
- Turn off on-screen displays.

On this (recording) VCR
- Press INPUT SELECT to display the addressed input in the display window.
- Set the REC LEVEL control on the VCR to 5 and the REC BALANCE control on the VCR to the centre.
- Press TAPE SPEED to select the recording tape speed (SP/LP).

1 Insert a source tape with its safety tab removed into the other (playback) VCR and insert a blank tape into this (recording) VCR.

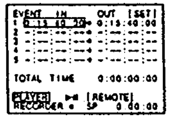
2 Press ASSEMBLE on this VCR.
The programme assemble editing menu appears on the TV screen.



EVENT IN OUT [SET]
1 0:10:30:30 -:--:--:--
2 -:--:--:-- -:--:--:--
3 -:--:--:-- -:--:--:--
4 -:--:--:-- -:--:--:--
5 -:--:--:-- -:--:--:--
TOTAL TIME 0:00:00:00
PLAYER ●
RECORDER ● SP 0:00:00

3 Press LANC REMOTE on this VCR so that the indicator lights up.
Switching on LANC REMOTE allows you to control the other (playback) VCR from this VCR.

4 Set the other (playback) VCR to playback pause mode and use the JOG dial or SHUTTLE ring on this VCR to find the starting (IN) point for the first event, then press MARK.
The time counter (frame number) is displayed as the IN point.
To correct the IN point, press BACK and repeat this step.



EVENT IN OUT [SET]
1 0:15:40:30 0:15:40:00
2 -:--:--:-- -:--:--:--
3 -:--:--:-- -:--:--:--
4 -:--:--:-- -:--:--:--
5 -:--:--:-- -:--:--:--
TOTAL TIME 0:00:00:00
PLAYER ▶‖ [REMOTE]
RECORDER ● SP 0:00:00

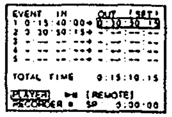
Notes

- If a scene you want to record is marked with Time Codes of less than 0:01:00:00, the scene will be edited inaccurately. In this case, use the editing procedure on page 50.
- During fast-forwarding or rewinding, if the Time Code is displayed as "-:--:--," programme assemble editing may not function. In this case, use the editing procedure on page 50.
- The IN and OUT points should be separated by more than two seconds.
- If you don't specify the OUT point, the tape will record through to the end.
- If you use a source tape recorded in both LP and SP or with blank sections, the IN and/or OUT points may be inaccurate.
- Programme assemble editing may not function properly depending on tape conditions. In this case, try manual editing.

5 **Use the JOG dial or SHUTTLE ring on this VCR to find the end (OUT) point of the first event, then press MARK.**

The time counter (frame number) is displayed as the OUT point.

To correct the OUT point, press BACK and repeat this step.

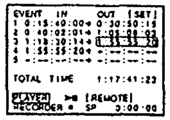


```
EVENT   IN           OUT  [SET]
1 0:15:40:00→ 0:30:50:15
2 0:30:50:15→ -:--:--:--
3 -:--:--:--→ -:--:--:--
4 -:--:--:--→ -:--:--:--
5 -:--:--:--→ -:--:--:--

TOTAL TIME      0:15:10:15

PLAYER   ▶■  [REMOTE]
RECORDER ●  SP   0:30:00
```

6 **Repeat steps 4 and 5 to select other IN and OUT points for editing.**

Up to 12 events can be selected for programme assemble editing.

The total time of the events you have selected is displayed.



```
EVENT   IN           OUT  [SET]
1 0:15:40:00→ 0:30:50:15
2 0:40:02:01→ 1:05:08:03
3 1:18:30:14→ 1:55:55:20
4 1:55:55:20→ -:--:--:--
5 -:--:--:--→ -:--:--:--

TOTAL TIME      1:17:41:23

PLAYER   ▶■  [REMOTE]
RECORDER ●  SP   0:00:00
```

7 **When you have finished selecting events, press ■ STOP.**

8 **Press LANC REMOTE on this VCR to turn off the indicator. Then turn the JOG dial or SHUTTLE ring to find the point where you want to start recording.**

When the starting point has been found, press ❚❚ PAUSE and then ● REC.

9 **Press SYNCHRO EDIT/START to start editing.**

The indicator on the button lights up and the programme assemble editing starts.

When all the designated events are edited, this (recording) VCR enters recording pause mode and the other (playback) VCR enters stop mode.

(continued)

Programme assemble editing (continued)

To assemble edit more than 12 events

Repeat the above programme assemble procedure after one session is finished.

1 After you've finished one assemble editing session, press ASSEMBLE. The assemble editing mode is cancelled, and the IN and OUT points stored in memory are erased.
2 Press ■ STOP to cancel the recording pause.
3 Repeat steps **1** to **9**.

To change the settings stored in memory

Press BACK on the VCR. Repeat pressing BACK to go back to the desired event to change. And then update the IN and OUT points following the procedure in steps **4** and **5**.

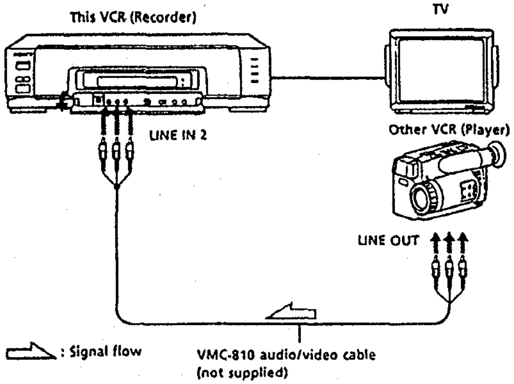
To stop assemble editing temporarily

Press SYNCHRO EDIT/START. When you restart assemble editing by pressing SYNCHRO EDIT/START again, editing starts from the first event.

Hooking up to a VCR without a LANC cable

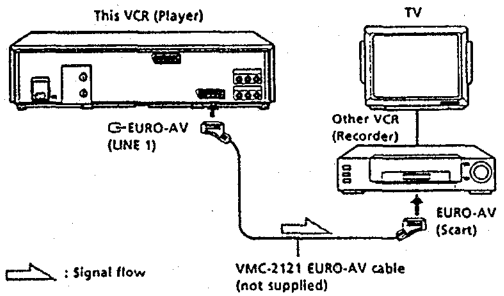
This section shows you how to edit to or from another VCR or camcorder which is not equipped with a LANC connector. You can make a copy of a tape using this VCR for recording or playback.

How to hook up to record on this VCR


This VCR (Recorder)
TV
LINE IN 2
Other VCR (Player)
LINE OUT
: Signal flow
VMC-810 audio/video cable
(not supplied)

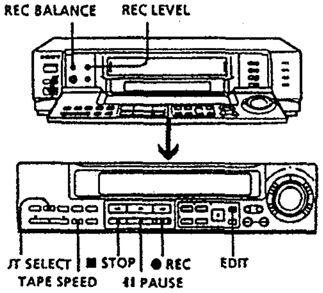
Tips
- Make sure you connect the plugs to jacks of the same colour.
- To connect the playback VCR, you can use the ⇥EURO-AV LINE IN 3 connector or the LINE IN 4 jacks as well. In this case, press INPUT SELECT to display "L3" or "L4" in the display window.
- If the other VCR is a monaural type and you connect it to the LINE IN 2 or LINE IN 4 jacks, leave the red plugs unconnected.

How to hook up to record on another VCR


This VCR (Player)
TV
⇥EURO-AV
(LINE 1)
Other VCR
(Recorder)
EURO-AV
(Scart)
: Signal flow
VMC-2121 EURO-AV cable
(not supplied)

Tips
- If the other VCR doesn't have a EURO-AV (Scart) connector, use the VMC-2106 EURO-AV cable instead and connect the cable to the line in jacks of the other VCR.
- To connect the recording VCR, you can use the LINE OUT 2 jacks as well.

Basic editing without a LANC connection


REC BALANCE
REC LEVEL
JT SELECT
TAPE SPEED
■ STOP
II PAUSE
● REC
EDIT

Making a copy of a tape

Before you start editing...
- Follow the instructions on page 57 to hook up your VCRs.
- Turn on your TV and tune in to the VCR.

On the playback VCR
- Switch on the EDIT mode if available.
- Turn off on-screen displays.
- When recording from a stereo/bilingual source tape, set the playback VCR to output both main and sub channels.

On this (recording) VCR
- Press EDIT to display "EDIT" in the display window.
- Press INPUT SELECT to display the addressed input in the display window.
- Set the REC LEVEL control on the VCR to 5 and the REC BALANCE control on the VCR to the centre.
- Press TAPE SPEED to select the recording tape speed (SP/LP).

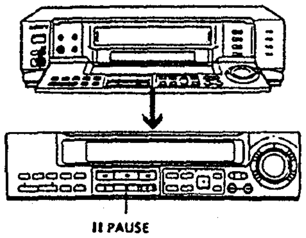
1 **Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.**

2 **Insert a tape into this (recording) VCR. Search for the point to start recording and set it to playback pause.**

3 **Press ● REC on this VCR and set it to recording pause.**

4 **To start editing, press the II PAUSE buttons on both VCRs to release the VCRs from pause.**
For best results, press II PAUSE on this VCR before pressing the pause button on the other VCR.

To stop editing
Press the ■ STOP buttons on both VCRs.



Cutting out unwanted scenes

You can edit out unnecessary scenes while making a copy of a tape.

Before you start editing...
Prepare the playback VCR and this (recording) VCR following the instructions for "Making a copy of a tape" on page 58.

1 **Follow steps 1 to 4 on page 58 to start editing.**

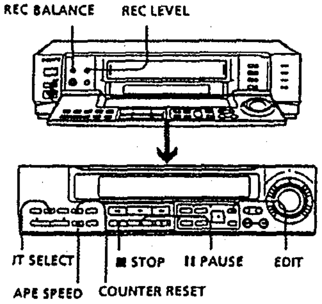
2 **When you come to a section that you want to leave out, press II PAUSE on this VCR.**

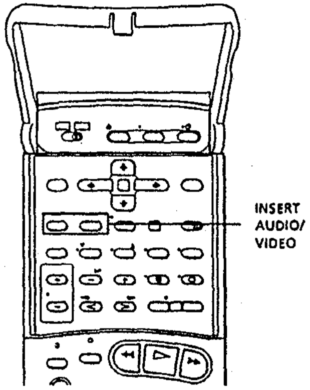
3 **Find the next starting point on the source tape and set the playback VCR to playback pause.**

4 **To resume editing, press the II PAUSE buttons on both VCRs.**

To stop editing
Press the ■ STOP buttons on both VCRs.

Insert editing without a LANC connection





You can replace unwanted scenes with other scenes by recording pictures and/or sound over the recorded tape.
There are three kinds of insert editing.

- A/V insert - all the original video, hi-fi sound, and the normal audio sound are replaced.
- Video insert - the original video and hi-fi sound are replaced. The original monaural sound is left intact.
- Audio insert - only the original normal audio sound is retained. The original video and hi-fi sound are left intact.

Before you start editing...

- Follow the instructions on page 57 to hook up your VCRs.
- Turn on your TV and tune in to the VCR.

On the playback VCR

- Switch on the EDIT mode if available.
- Turn off on-screen displays.
- When recording a stereo/bilingual source tape, set the playback VCR to output both main and sub channels.

On this (recording) VCR

- Press EDIT to display "EDIT" in the display window.
- Press INPUT SELECT to display the addressed input in the display window.
- Set the REC LEVEL control on the VCR to $\boxed{5}$ and the REC BALANCE control on the VCR to the centre.
- Press TAPE SPEED to select the recording tape speed of the prerecorded tape.

1 **Insert a source tape into other (playback) VCR. Search for the point to start playback and set it to playback pause.**

2 **Insert the prerecorded tape into this (recording) VCR. Search for the end of the unwanted scene and set it to playback pause.**

3 **Press COUNTER RESET on this VCR to reset the counter to "0H00M00S".**

4 **Rewind the tape to the beginning of the unwanted scene and set this VCR to playback pause.**

Tip
- See "How sound is recorded on a video tape" on page 26.

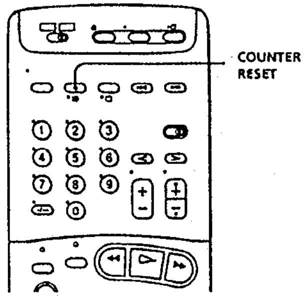
5 Press the INSERT buttons according to the following:

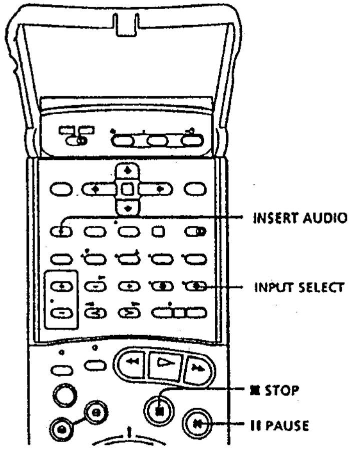
For	Press	So that
A/V insert	INSERT AUDIO, then INSERT VIDEO	the AUDIO INSERT and VIDEO INSERT indicators on the VCR light up and "AV INS" appears on the TV screen.
Video insert	INSERT VIDEO	the VIDEO INSERT indicator on the VCR lights up and "V INS" appears on the TV screen.
Audio insert	INSERT AUDIO	the AUDIO INSERT indicator on the VCR lights up and "A INS" appears on the TV screen.

6 To start editing simultaneously press the ІІ PAUSE buttons on this VCR and on the other VCR.
When the counter of this VCR reaches "0H00M00S," editing stops automatically.

To stop editing
Press the ■ STOP buttons on both VCRs.

Audio dubbing for commentary and background music

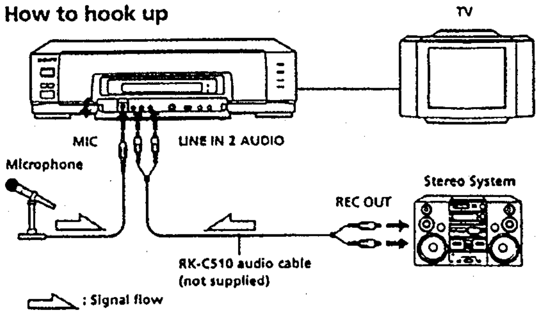




Note
You must be in playback pause mode before pressing INSERT AUDIO. (If you are in recording pause mode, you cannot use the audio dubbing function.)

You can add music or narration on the normal audio track. The monaural sound previously recorded is replaced while the original picture and hi-fi sound on the main track are retained. (See page 26.)

How to hook up



Operation

Before you start ...
Press INPUT SELECT to display "L2" in the display window.

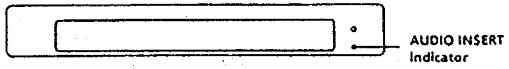
1 Play a recording source. Search for the point to start playback and set it to playback pause.

2 Insert the prerecorded tape into this VCR. Search for the end of the section you want to dub new sound to and set it to playback pause.
Make sure that the tape has its safety tab in place so that you can dub new sound onto it.

3 Press COUNTER RESET on this VCR to reset the counter to "0H00M00S."

4 Rewind the tape to the beginning of the section and set this VCR to playback pause.

5 Press INSERT AUDIO.
The AUDIO INSERT indicator lights on the VCR and "A INS" appears on the TV screen.



6 **To start editing, press the ❙❙ PAUSE button on this VCR and simultaneously press the ❙❙ PAUSE button on the stereo system or speak into microphone.**
When the counter of this VCR reaches "0H00M00S," audio dubbing stops automatically.

To stop editing
Press the ■ STOP buttons on this VCR and the stereo system.

Listening to both audio tracks during playback

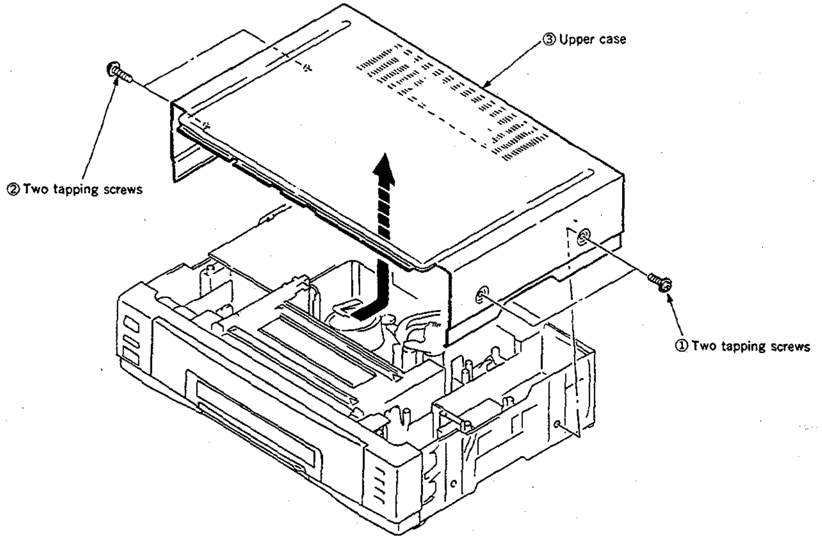
When playing an audio-dubbed tape, you have a choice of listening to either the prerecorded hi-fi audio or the inserted normal audio sounds using the AUDIO MONITOR button. To listen to the sounds recorded on the hi-fi audio and normal audio tracks at the same time, set AUDIO MIX to ON in the SET UP MENU. See page 53.
After playing the audio-dubbed tape, reset AUDIO MIX to OFF.

Tips
- The sound from the LINE IN 2 AUDIO jacks and the MIC jack are mixed.
- For fade-in operation, turn the REC LEVEL control from the zero point to the normal position $\boxed{5}$.
  For fade-out operation, turn it from the normal position to the zero point.

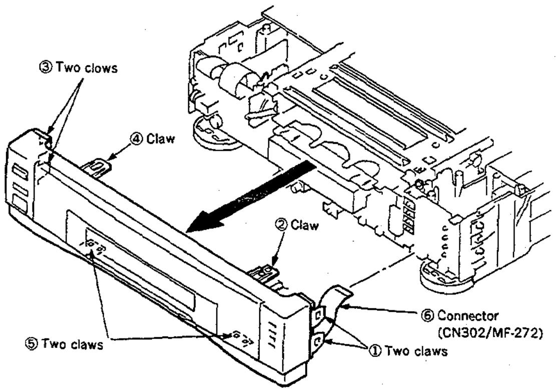
Note
- If AUDIO MIX remains ON, the AUDIO MONITOR button remains inoperative.

SECTION 2
DISASSEMBLY

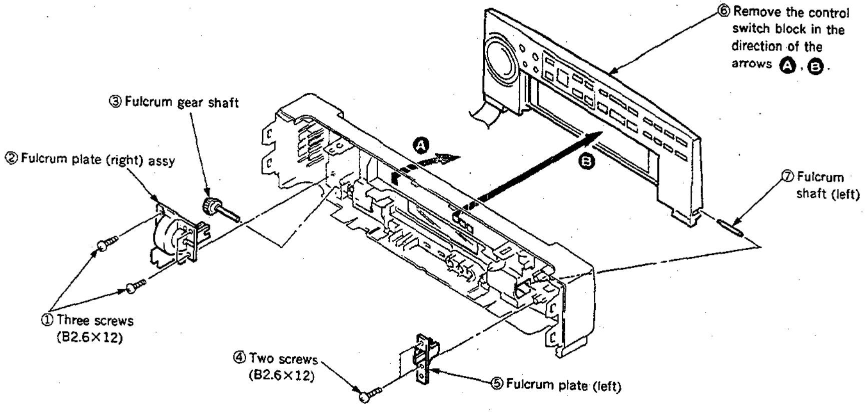
2-1. REMOVAL OF UPPER CASE


③ Upper case
② Two tapping screws
① Two tapping screws

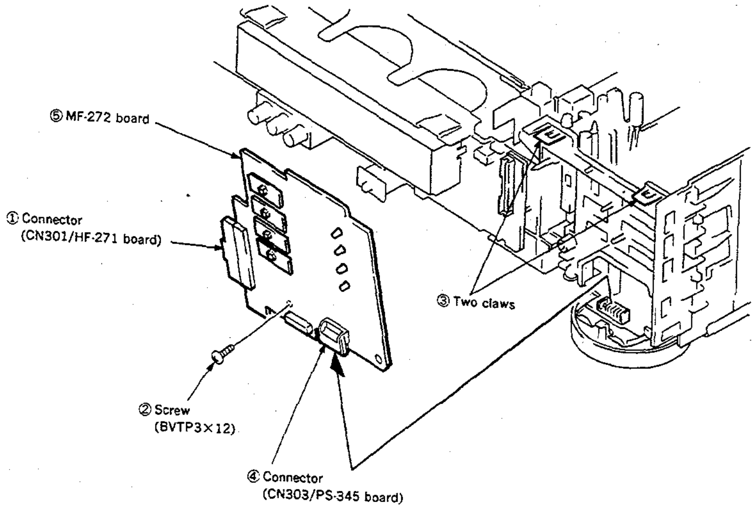
2-2. REMOVAL OF FRONT PANEL ASSEMBLY


③ Two clows
④ Claw
② Claw
⑥ Connector
(CN302/MF-272)
⑤ Two claws
① Two claws

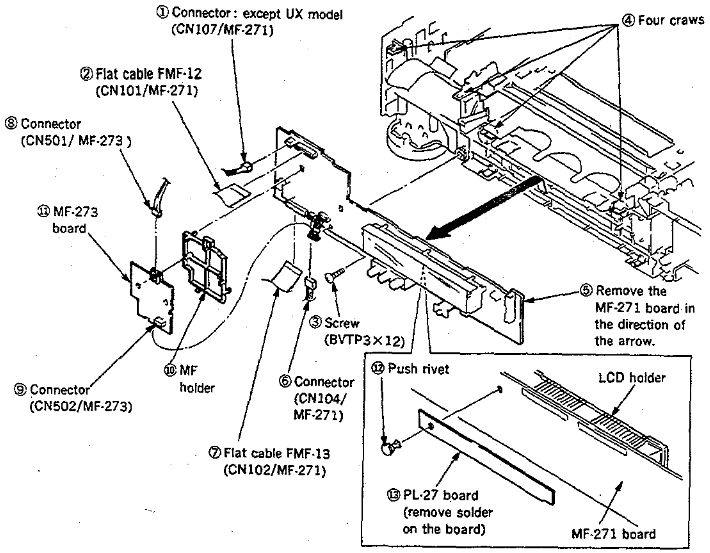
2-3. REMOVAL OF CONTROL SWITCH BLOCK


⑥ Remove the control switch block in the direction of the arrows Ⓐ, Ⓑ.
③ Fulcrum gear shaft
② Fulcrum plate (right) assy
Ⓐ
Ⓑ
⑦ Fulcrum shaft (left)
① Three screws (B2.6×12)
④ Two screws (B2.6×12)
⑤ Fulcrum plate (left)

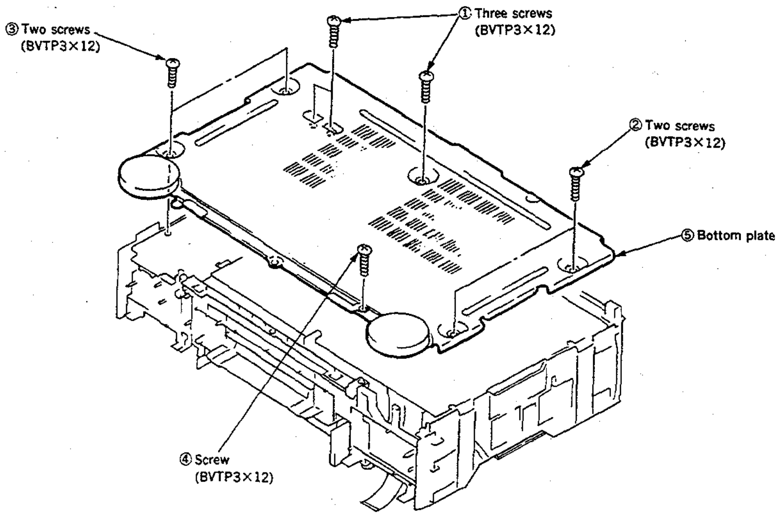
2-4. REMOVAL OF MF-272 BOARD


⑤ MF-272 board
① Connector (CN301/HF-271 board)
③ Two claws
② Screw (BVTP3×12)
④ Connector (CN303/PS-345 board)

2-5. REMOVAL OF MF-271 BOARD, MF-273 BOARD AND PL-27 BOARD

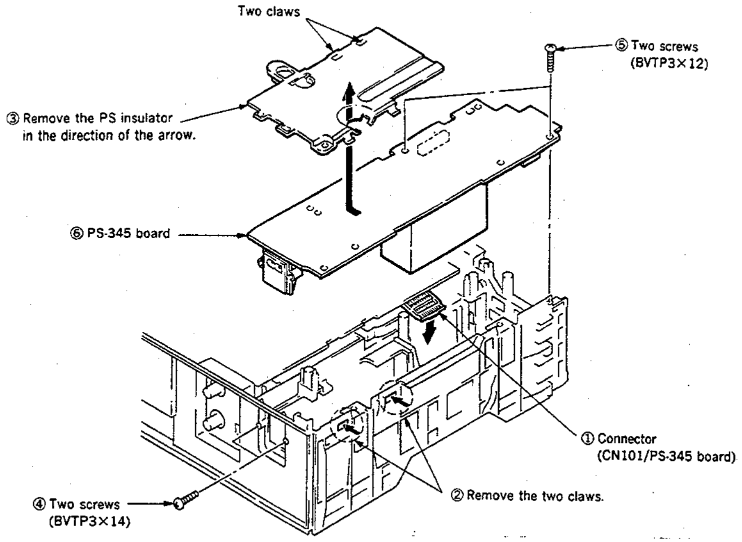

① Connector : except UX model (CN107/MF-271)
④ Four craws
② Flat cable FMF-12 (CN101/MF-271)
⑧ Connector (CN501/ MF-273)
⑪ MF-273 board
⑤ Remove the MF-271 board in the direction of the arrow.
③ Screw (BVTP3×12)
⑨ Connector (CN502/MF-273)
⑩ MF holder
⑥ Connector (CN104/ MF-271)
⑫ Push rivet
LCD holder
⑦ Flat cable FMF-13 (CN102/MF-271)
⑬ PL-27 board (remove solder on the board)
MF-271 board

2-6. REMOVAL OF BOTTOM PLATE

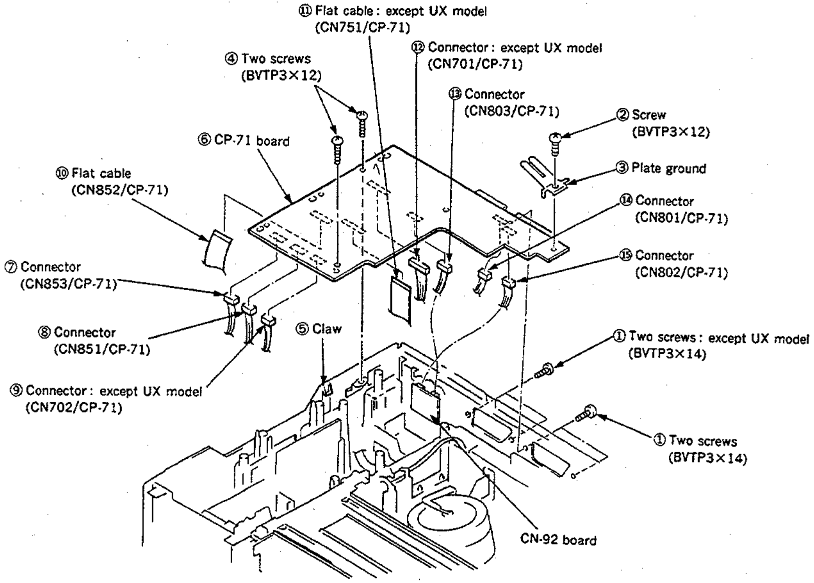

③ Two screws (BVTP3×12)
① Three screws (BVTP3×12)
② Two screws (BVTP3×12)
⑤ Bottom plate
④ Screw (BVTP3×12)

2-7. REMOVAL OF PS-345 BOARD

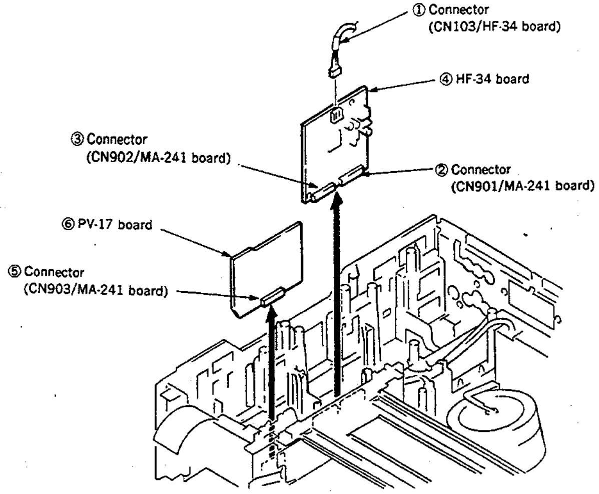
Note : Disconnect the connector ① and put the bottom surface upside.


Two claws
⑤ Two screws
(BVTP3×12)
③ Remove the PS insulator
in the direction of the arrow.
⑥ PS-345 board
① Connector
(CN101/PS-345 board)
② Remove the two claws.
④ Two screws
(BVTP3×14)

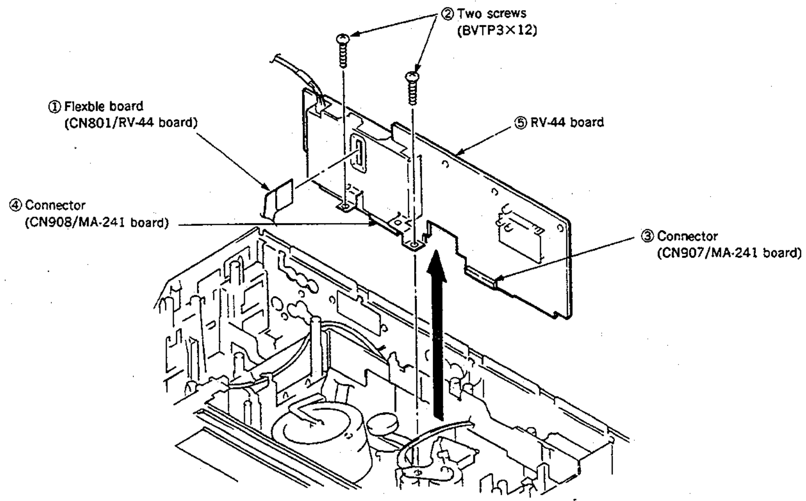
2-8. REMOVAL OF CP-71 BOARD


⑪ Flat cable : except UX model
(CN751/CP-71)
⑫ Connector : except UX model
(CN701/CP-71)
④ Two screws
(BVTP3×12)
⑬ Connector
(CN803/CP-71)
② Screw
(BVTP3×12)
⑥ CP-71 board
③ Plate ground
⑩ Flat cable
(CN852/CP-71)
⑭ Connector
(CN801/CP-71)
⑮ Connector
(CN802/CP-71)
⑦ Connector
(CN853/CP-71)
⑧ Connector
(CN851/CP-71)
⑤ Claw
① Two screws : except UX model
(BVTP3×14)
⑨ Connector : except UX model
(CN702/CP-71)
① Two screws
(BVTP3×14)
CN-92 board

2-9. REMOVAL OF HF-34 BOARD AND PV-17 BOARD

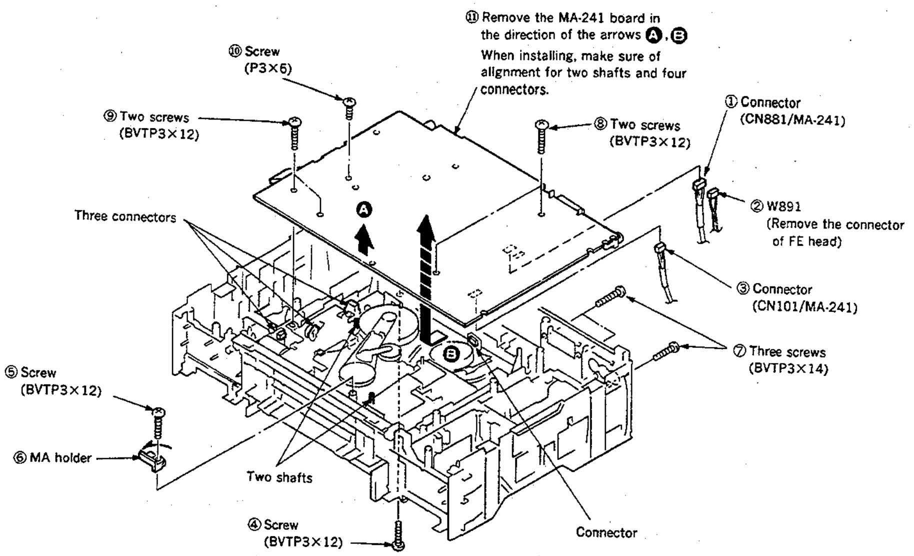

① Connector
(CN103/HF-34 board)
④ HF-34 board
③ Connector
(CN902/MA-241 board)
② Connector
(CN901/MA-241 board)
⑥ PV-17 board
⑤ Connector
(CN903/MA-241 board)

2-10. REMOVAL OF RV-44 BOARD


② Two screws
(BVTP3×12)
① Flexble board
(CN801/RV-44 board)
⑤ RV-44 board
④ Connector
(CN908/MA-241 board)
③ Connector
(CN907/MA-241 board)

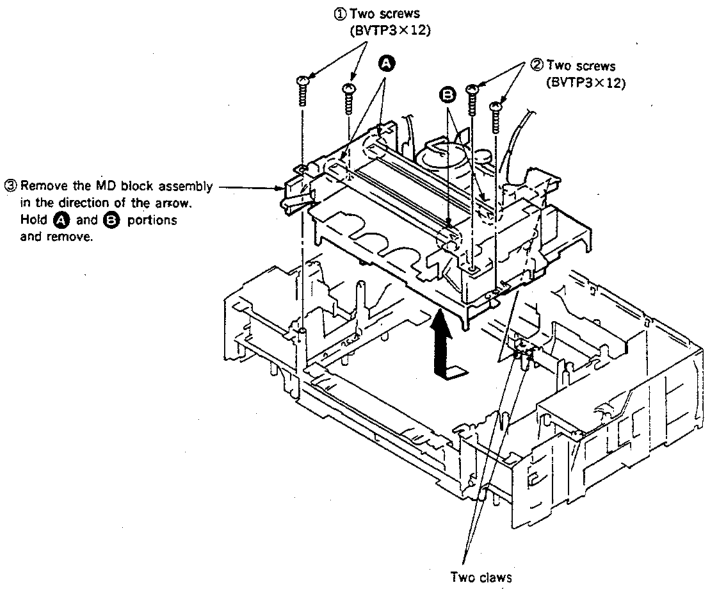
2-11. REMOVAL OF MA-241 BOARD

Note: Remove harnesses ①, ② and ③ and ④ fixing RF modulator (MA-241 board), then put the bottom of the set up.


⑩ Screw
(P3×6)
⑨ Two screws
(BVTP3×12)
⑧ Two screws
(BVTP3×12)
① Connector
(CN881/MA-241)
② W891
(Remove the connector of FE head)
Three connectors
❹
❺
③ Connector
(CN101/MA-241)
⑦ Three screws
(BVTP3×14)
⑤ Screw
(BVTP3×12)
⑥ MA holder
Two shafts
④ Screw
(BVTP3×12)
Connector

⑪ Remove the MA-241 board in the direction of the arrows Ⓐ, Ⓑ
When installing, make sure of alignment for two shafts and four connectors.

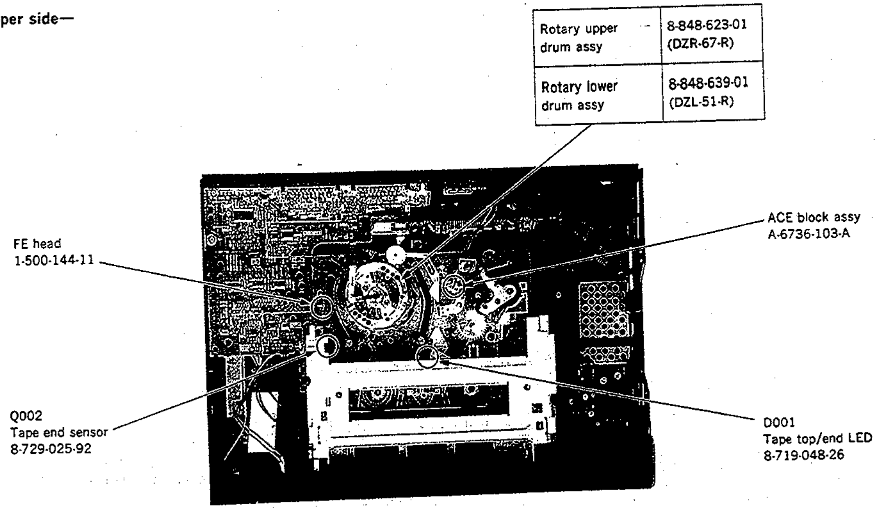
2-12. REMOVAL OF MD BLOCK ASSEMBLY


① Two screws
(BVTP3×12)
Ⓐ
Ⓑ
② Two screws
(BVTP3×12)
Two claws

③ Remove the MD block assembly in the direction of the arrow.
Hold Ⓐ and Ⓑ portions and remove.

2-13. INTERNAL VIEWS

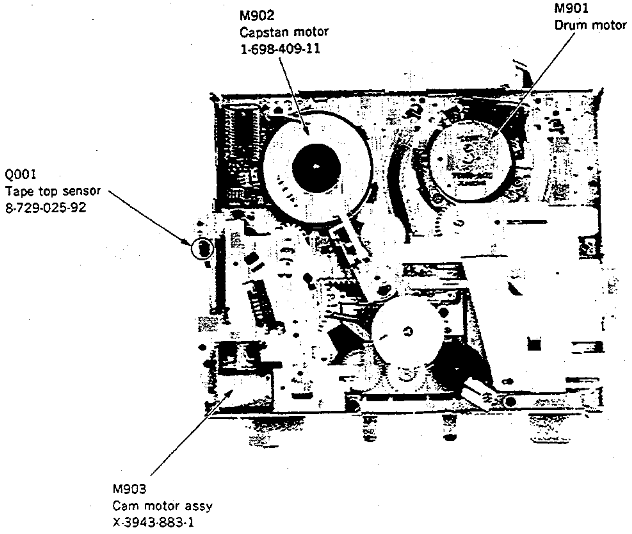
—Upper side—



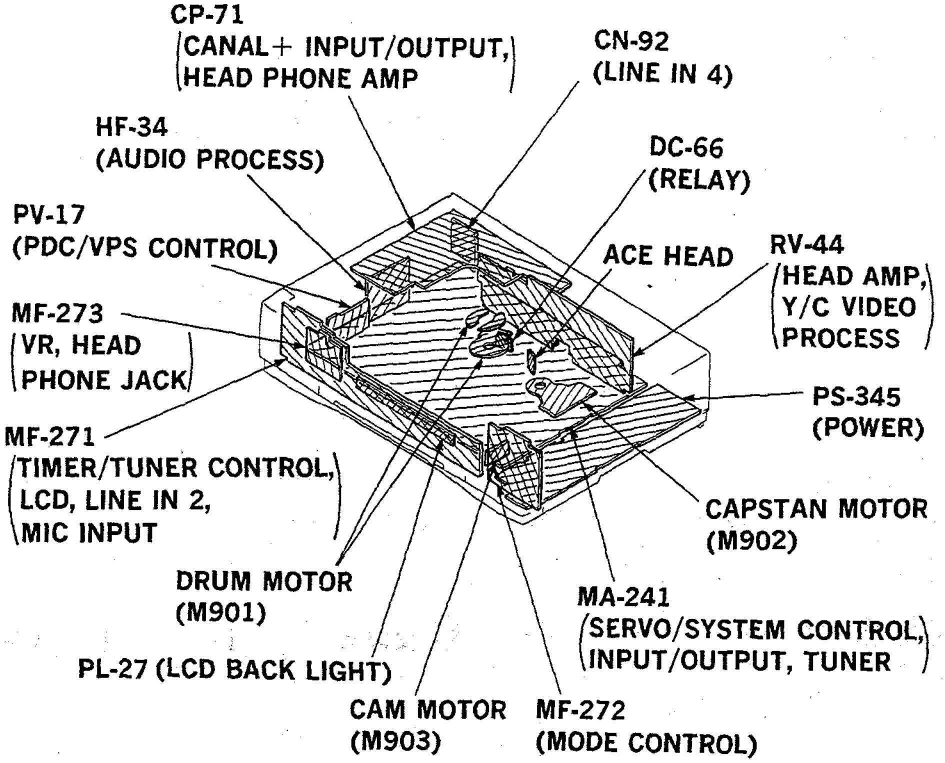
Rotary upper drum assy	8-848-623-01 (DZR-67-R)
Rotary lower drum assy	8-848-639-01 (DZL-51-R)

FE head
1-500-144-11
ACE block assy
A-6736-103-A
Q002
Tape end sensor
8-729-025-92
D001
Tape top/end LED
8-719-048-26

—Lower side—

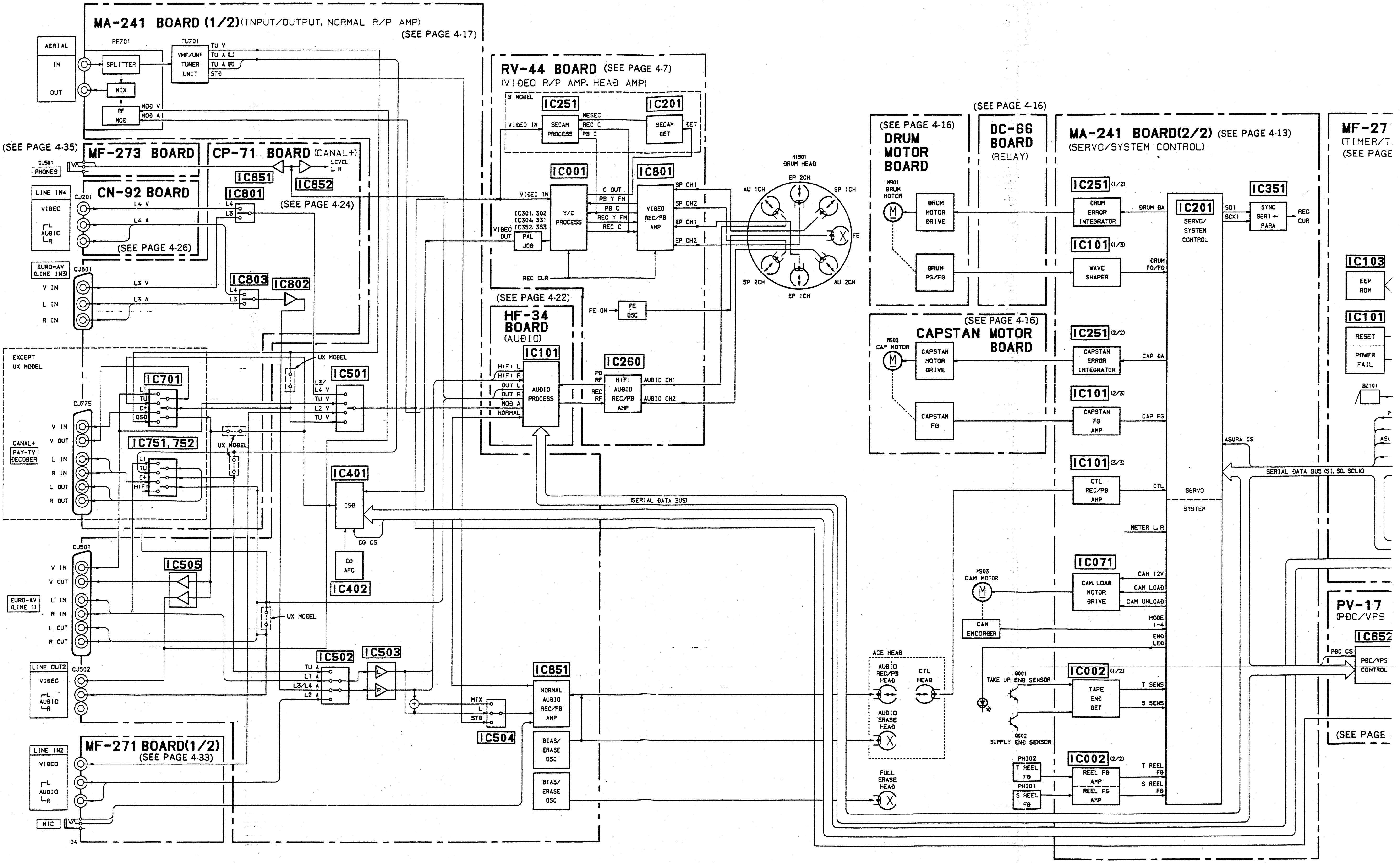

M902
Capstan motor
1-698-409-11
M901
Drum motor
Q001
Tape top sensor
8-729-025-92
M903
Cam motor assy
X-3943-883-1

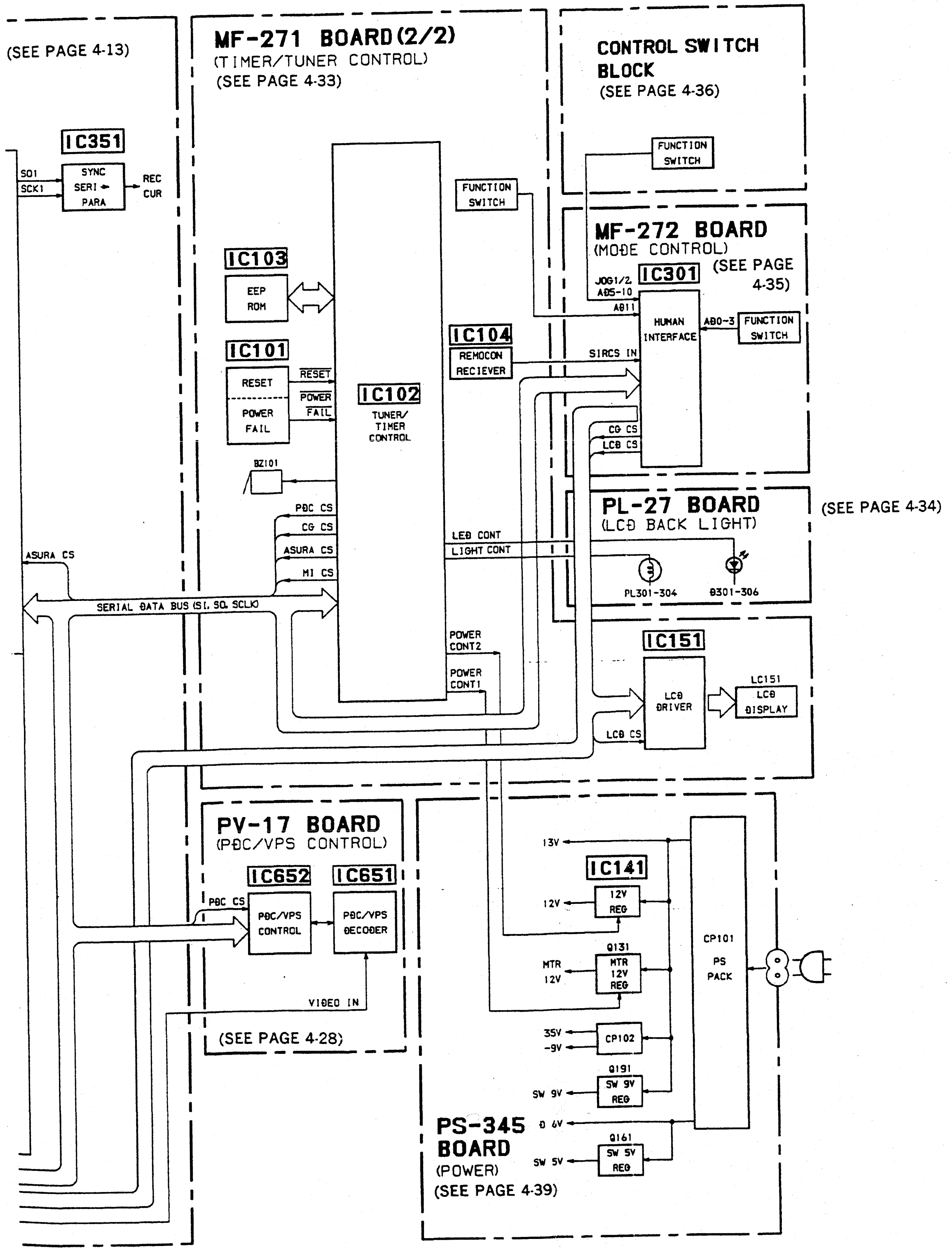
2-14. CIRCUIT BOARDS LOCATION


CP-71
(CANAL+ INPUT/OUTPUT,
HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP,
Y/C VIDEO
PROCESS)
MF-273
(VR, HEAD
PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL,
LCD, LINE IN 2,
MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL,
INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)

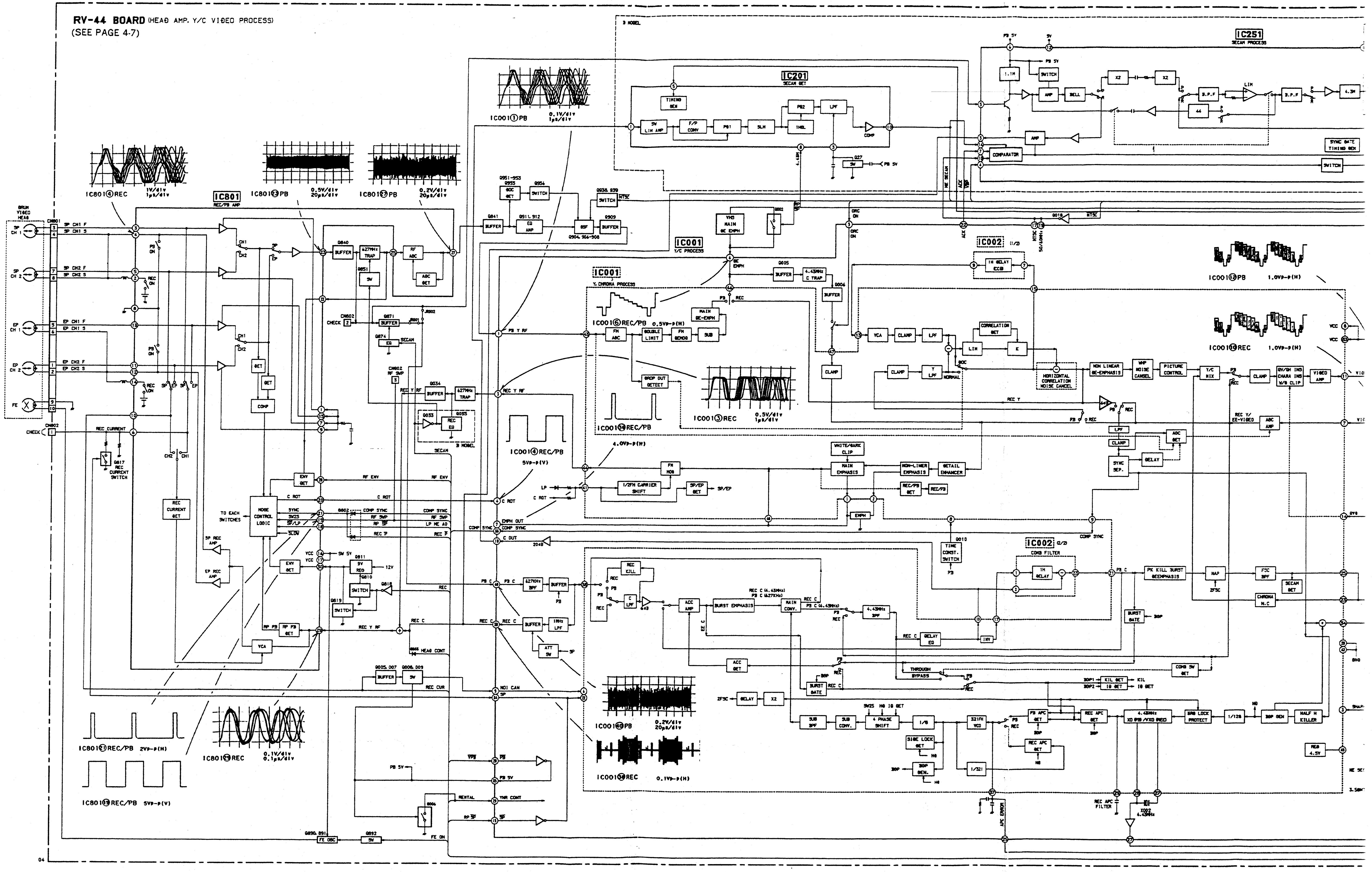
SECTION 3
BLOCK DIAGRAMS

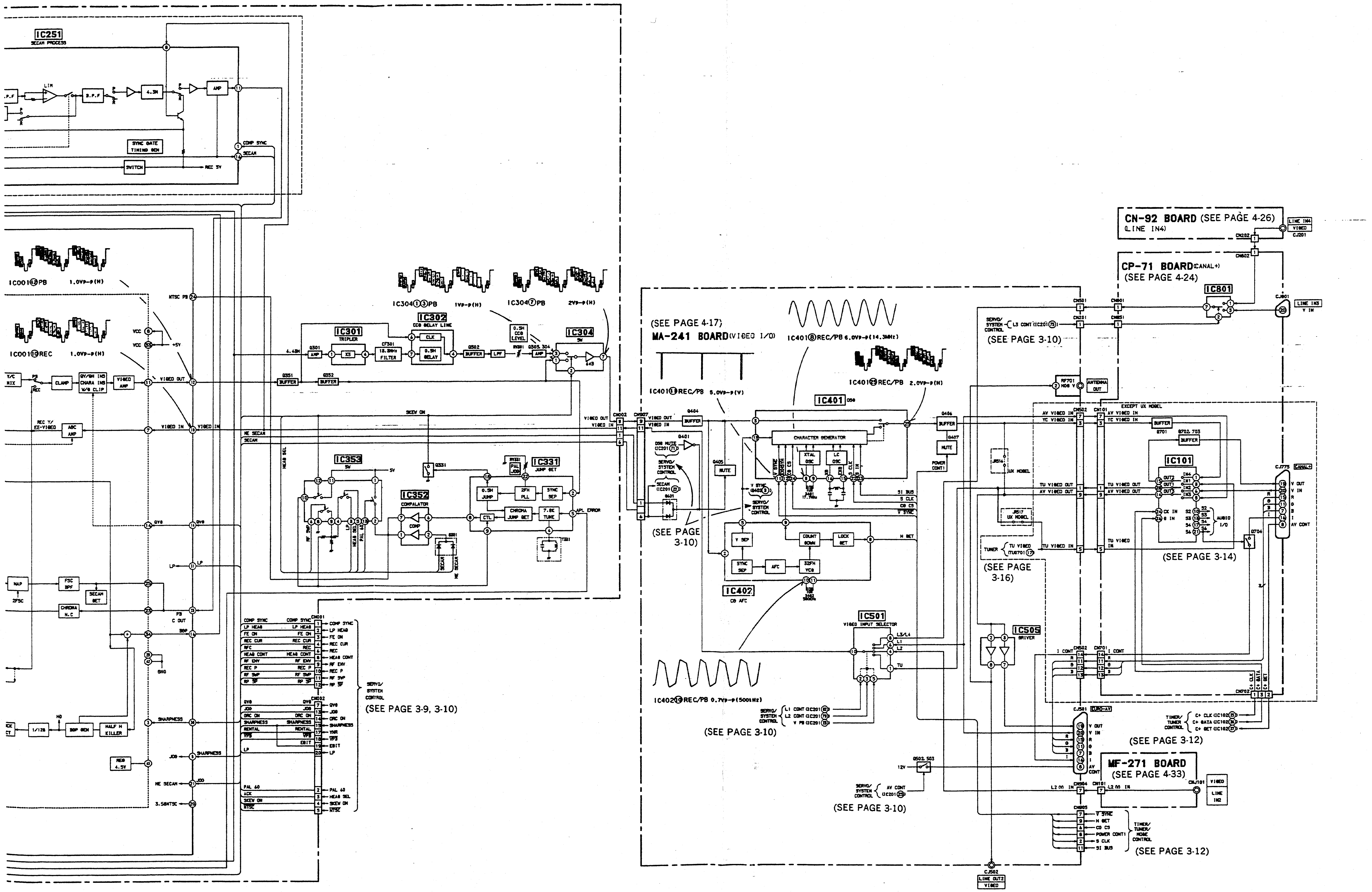
3-1. OVERALL BLOCK DIAGRAM


MA-241 BOARD (1/2) (INPUT/OUTPUT, NORMAL R/P AMP)
(SEE PAGE 4-17)
AERIAL
IN
OUT
RF701
SPLITTER
MIX
RF MOD
TU701
VHF/UHF TUNER UNIT
TU V
TU A (L)
TU A (R)
STD
MOD V
MOD A
(SEE PAGE 4-35)
MF-273 BOARD
CJ501
PHONES
CP-71 BOARD (CANAL+)
LEVEL L R
IC851
IC852
LINE IN4
VIDEO
AUDIO L R
CJ201
CN-92 BOARD
L4 V
L4 A
(SEE PAGE 4-26)
IC801
(SEE PAGE 4-24)
EURO-AV (LINE IN3)
CJ801
V IN
L IN
R IN
L3 V
L3 A
IC803
IC802
EXCEPT UX MODEL
CJ775
IC701
IC751, 752
CANAL+ PAY-TV DECODER
V IN
V OUT
L IN
R IN
L OUT
R OUT
UX MODEL
IC501
L3/L4 V
TU V
L2 V
IC401
OSD
CG CS
CG AFC
IC402
CJ501
EURO-AV (LINE 1)
IC505
UX MODEL
LINE OUT2
CJ502
VIDEO
AUDIO L R
IC502
IC503
TU A
L1 A
L3/L4 A
L2 A
MIX
L
R
STD
IC504
LINE IN2
MF-271 BOARD(1/2)
(SEE PAGE 4-33)
MIC
RV-44 BOARD (SEE PAGE 4-7)
(VIDEO R/P AMP, HEAD AMP)
B MODEL
IC251
IC201
VIDEO IN
SECAM PROCESS
MESEC
REC C
PB C
SECAM DET
DET
IC001
IC801
VIDEO IN
IC301, 302
IC304, 331
IC352, 353
Y/C PROCESS
C OUT
PB Y FM
PB C
REC Y FM
REC C
VIDEO REC/PB AMP
SP CH1
SP CH2
EP CH1
EP CH2
VIDEO OUT
PAL JOG
REC CUR
FE ON
FE OSC
(SEE PAGE 4-22)
HF-34 BOARD (AUDIO)
IC101
HiFi L
HiFi R
OUT L
OUT R
MOD A
NORMAL
AUDIO PROCESS
IC260
PB RF
REC RF
HiFi AUDIO REC/PB AMP
AUDIO CH1
AUDIO CH2
(SERIAL DATA BUS)
IC851
NORMAL AUDIO REC/PB AMP
BIAS/ERASE OSC
BIAS/ERASE OSC
M1901 DRUM HEAD
EP 2CH
AU 1CH
SP 1CH
FE
SP 2CH
AU 2CH
EP 1CH
ACE HEAD
AUDIO REC/PB HEAD
CTL HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
(SEE PAGE 4-16)
DRUM MOTOR BOARD
M901 DRUM MOTOR
DRUM MOTOR DRIVE
DRUM PG/FG
(SEE PAGE 4-16)
DC-66 BOARD (RELAY)
(SEE PAGE 4-16)
CAPSTAN MOTOR BOARD
M902 CAP MOTOR
CAPSTAN MOTOR DRIVE
CAPSTAN FG
MA-241 BOARD(2/2) (SEE PAGE 4-13)
(SERVO/SYSTEM CONTROL)
IC251 (1/2)
DRUM ERROR INTEGRATOR
DRUM DA
IC101 (1/3)
WAVE SHAPER
DRUM PG/FG
IC251 (2/2)
CAPSTAN ERROR INTEGRATOR
CAP DA
IC101 (2/3)
CAPSTAN FG AMP
CAP FG
IC101 (3/3)
CTL REC/PB AMP
CTL
METER L, R
IC201
SERVO/SYSTEM CONTROL
SERVO
SYSTEM
SD1
SCK1
IC351
SYNC SERI → PARA
REC CUR
ASURA CS
SERIAL DATA BUS (SI, SO, SCLK)
M903 CAM MOTOR
IC071
CAM LOAD MOTOR DRIVE
CAM 12V
CAM LOAD
CAM UNLOAD
CAM ENCODER
MODE 1-4
END LED
Q001 TAKE UP END SENSOR
Q002 SUPPLY END SENSOR
IC002 (1/2)
TAPE END DET
T SENS
S SENS
PH1002
T REEL FG
PH1001
S REEL FG
IC002 (2/2)
REEL FG AMP
REEL FG AMP
T REEL FG
S REEL FG
MF-27
(TIMER/
(SEE PAGE
IC103
EEP ROM
IC101
RESET
POWER FAIL
BZ101
PV-17
(PDC/VPS
IC652
PDC CS
PDC/VPS CONTROL
(SEE PAGE

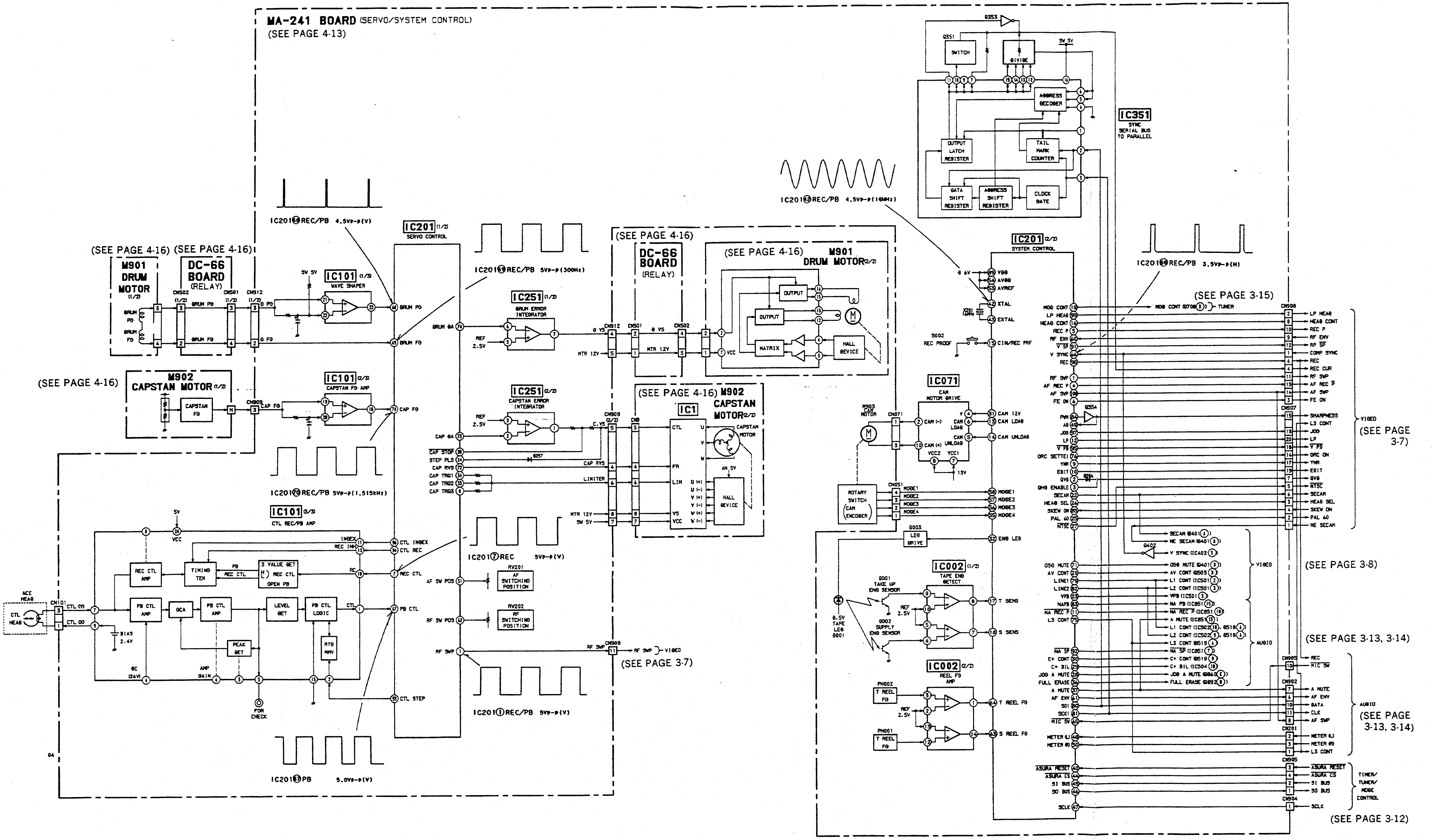

(SEE PAGE 4-13)
IC351
SO1
SCK1
SYNC SERI → PARA
REC CUR
ASURA CS
SERIAL DATA BUS (SI, SO, SCLK)
MF-271 BOARD (2/2)
(TIMER/TUNER CONTROL)
(SEE PAGE 4-33)
IC103
EEP ROM
IC101
RESET
POWER FAIL
RESET
POWER FAIL
IC102
TUNER/ TIMER CONTROL
BZ101
PDC CS
CD CS
ASURA CS
MI CS
FUNCTION SWITCH
IC104
REMOCON RECIEVER
LED CONT
LIGHT CONT
POWER CONT2
POWER CONT1
CONTROL SWITCH BLOCK
(SEE PAGE 4-36)
FUNCTION SWITCH
MF-272 BOARD
(MODE CONTROL)
(SEE PAGE 4-35)
JOG1/2
AD5-10
AD11
IC301
HUMAN INTERFACE
AD0-3
FUNCTION SWITCH
SIRCS IN
CD CS
LCD CS
PL-27 BOARD
(LCD BACK LIGHT)
(SEE PAGE 4-34)
PL301-304
D301-306
IC151
LCD DRIVER
LCD CS
LC151
LCD DISPLAY
PV-17 BOARD
(PDC/VPS CONTROL)
IC652
IC651
PDC CS
PDC/VPS CONTROL
PDC/VPS DECODER
VIDEO IN
(SEE PAGE 4-28)
PS-345 BOARD
(POWER)
(SEE PAGE 4-39)
13V
IC141
12V
12V REG
Q131
MTR 12V
MTR 12V REG
35V
-9V
CP102
Q191
SW 9V
SW 9V REG
D 6V
Q161
SW 5V
SW 5V REG
CP101
PS PACK

3-2. VIDEO BLOCK DIAGRAM

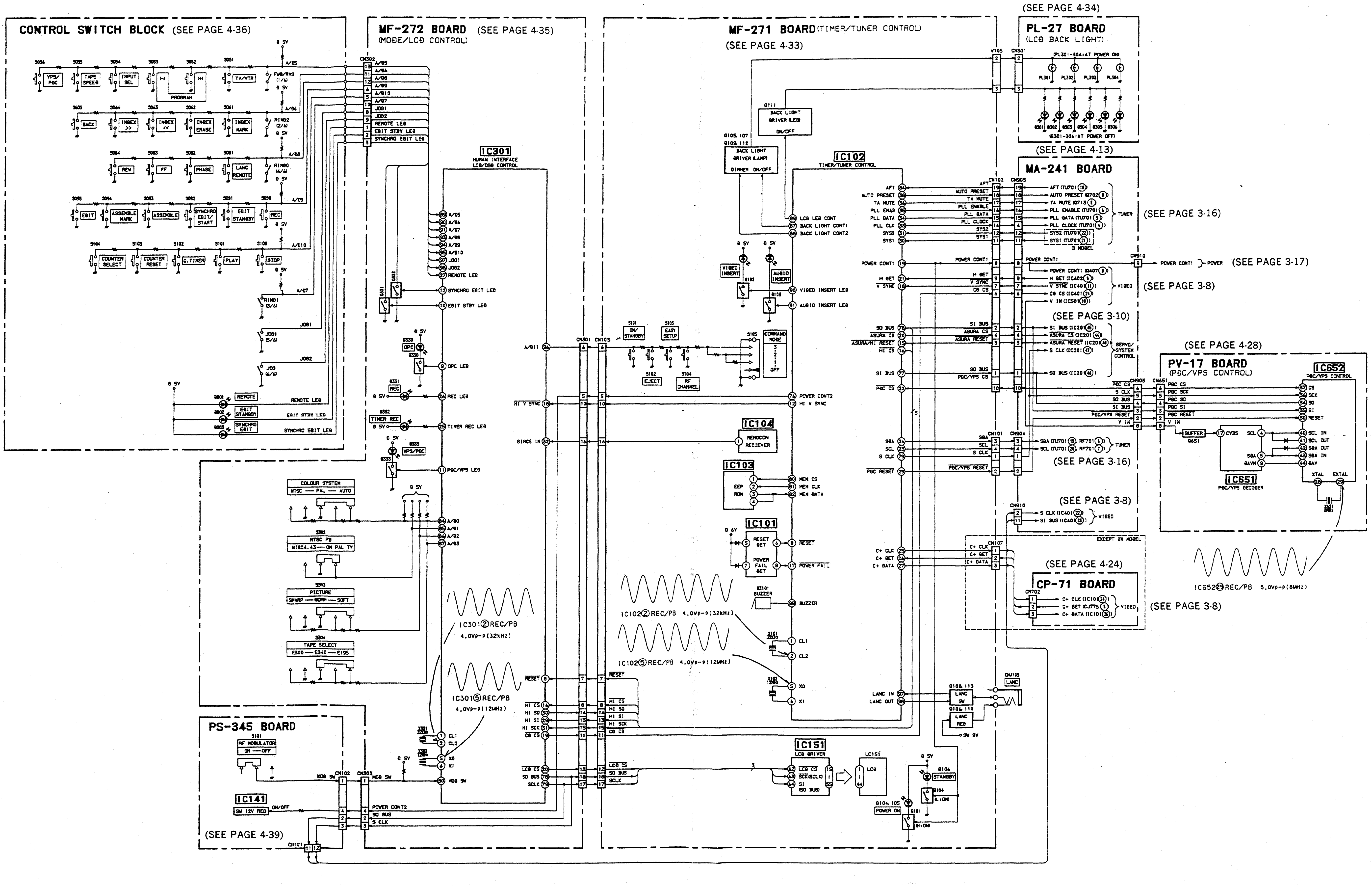

RV-44 BOARD (HEAD AMP, Y/C VIDEO PROCESS)
(SEE PAGE 4-7)
IC801
REC/PB AMP
IC001
Y/C PROCESS
IC001
Y, CHROMA PROCESS
IC201
SECAM DET
IC251
SECAM PROCESS
IC002 (1/2)
IC002 (2/2)
COMB FILTER
DRUM VIDEO HEAD
SP CH 1
SP CH 2
EP CH 1
EP CH 2
FE
CN801
CN802
CHECK
IC801④REC 1V/div 1μs/div
IC801㉓PB 0.5V/div 20μs/div
IC801㉗PB 0.2V/div 20μs/div
IC001①PB 0.1V/div 1μs/div
IC001⑥REC/PB 0.5Vp-p(H)
IC001③REC 0.5V/div 1μs/div
IC001㊾REC/PB
IC001④REC/PB 5Vp-p(V)
IC001㉛PB 0.2V/div 20μs/div
IC001㊽REC 0.1Vp-p(H)
IC001⑫PB 1.0Vp-p(H)
IC001⑩REC 1.0Vp-p(H)
IC801㉑REC/PB 2Vp-p(H)
IC801⑲REC 0.1V/div 0.1μs/div
IC801⑲REC/PB 5Vp-p(V)
4.0Vp-p(H)
MODE CONTROL LOGIC
TO EACH SWITCHES
REC CURRENT DET
REC CURRENT SWITCH
ENV DET
RF AGC
AGC DET
BUFFER
4.27MHz TRAP
EQ AMP
BSF
SWITCH
YNR MAIN DE EMPH
4.43MHz C TRAP
MAIN DE-EMPH
FM AGC
DOUBLE LIMIT
FM DEMOD
SUB
DROP OUT DETECT
YCA
CLAMP
LPF
CORRELATION DET
LIM
NON LINEAR DE-EMPHASIS
WHP NOISE CANCEL
PICTURE CONTROL
Y/C MIX
VIDEO AMP
SYNC SEP.
DELAY
WHITE/DARK CLIP
MAIN EMPHASIS
NON-LINEAR EMPHASIS
DETAIL ENHANCER
FM MOD
1/2FH CARRIER SHIFT
SP/EP DET
REC/PB DET
TIME CONST. SWITCH
1H DELAY
HORIZONTAL CORRELATION NOISE CANCEL
REC KILL
C LPF
ACC AMP
BURST EMPHASIS
MAIN CONV.
4.43MHz BPF
ACC DET
BURST GATE
SUB BPF
SUB CONV.
4 PHASE SHIFT
1/8
321FH VCO
PB APC DET
REC APC DET
4.43MHz XO (PB)/VXO (REC)
SBB LOCK PROTECT
1/128
BGP GEN
HALF H KILLER
SIDE LOCK DET
BGP GEN.
1/321
REC APC FILTER
X002 4.43MHz
APC ERROR
PK KILL BURST DEEMPHASIS
FSC BPF
SECAM DET
CHROMA N.C
COMB SW DET
KIL DET
ID DET
REG 4.5V
TIMING GEN
SW LIM AMP
F/P CONV
PB2
PB1
SLM
INBL
COMP
COMPARATOR
AMP
BELL
X2
B.P.F
4.3M
SYNC GATE TIMING GEN
ATT SW
HEAD CONT
NOI CAN
YNR CONT
RENTAL
FE OSC
5V
PB 5V
REC C
REC Y RF
PB Y RF
C ROT
EMPH OUT
COMP SYNC
C OUT
RF ENV
SP REC AMP
EP REC AMP
VCA
RF PB DET
SECAM
B MODEL
3 MODEL
NTSC


IC251
SECAM PROCESS
LIM
B.P.F
4.3M
AMP
SYNC GATE
TIMING GEN
SWITCH
REC 5V
COMP SYNC
SECAM
IC001⑫PB 1.0Vp-p(H)
IC001⑩REC 1.0Vp-p(H)
NTSC PB
VCC
+5V
Y/C MIX
PB
REC
CLAMP
QV/QH INS CHARA INS W/B CLIP
VIDEO AMP
VIDEO OUT
REC Y/ EE-VIDEO
ABC AMP
VIDEO IN
QVB
LP
NAP
2FSC
FSC BPF
SECAM BET
CHROMA N.C
PB C OUT
BGP
GND
SHARPNESS
1/128
HD
BGP GEN
HALF H KILLER
REG 4.5V
JOB
ME SECAM
3.58NTSC
4.43M
Q301
AMP
IC301
TRIPLER
X3
CF301
18.3MHz FILTER
IC302
CCD DELAY LINE
CLK
0.5H DELAY
Q302
BUFFER
LPF
RV301
Q303, 304
IC304
SW
6dB
IC304①③PB 1Vp-p(H)
IC304⑦PB 2Vp-p(H)
0.5H CCD LEVEL
Q351
BUFFER
Q352
BUFFER
SKEW ON
HEAD SEL
IC353
SW
5V
RF SWP
PAL 60
Q331
IC352
COMPALATOR
COMP
D301
SECAM
ME SECAM
RV331
PAL JOB
IC331
JUMP SET
0.5H JUMP
2FH PLL
SYNC SEP
CHROMA JUMP SET
7.8K TUNE
CTL
APL ERROR
T331
CN002
VIDEO OUT
VIDEO IN
CN001
COMP SYNC
LP HEAD
FE ON
REC CUR
RFC
REC
HEAD CONT
RF ENV
REC P
RF SWP
RP SP
CN002
QVB
JOB
ORC ON
SHARPNESS
RENTAL
YNR
VPS
EDIT
LP
PAL 60
ACK
HEAD SEL
SKEW ON
NTSC
SERVO/ SYSTEM CONTROL
(SEE PAGE 3-9, 3-10)
(SEE PAGE 4-17)
MA-241 BOARD (VIDEO I/O)
IC401⑪REC/PB 5.0Vp-p(V)
IC401⑧REC/PB 6.0Vp-p(14.3MHz)
IC401㉕REC/PB 2.0Vp-p(H)
CN907
VIDEO OUT
VIDEO IN
Q404
BUFFER
Q401
DSB MUTE (IC201 ㉑)
SERVO/ SYSTEM CONTROL
SECAM (IC201 ㉒)
D401
(SEE PAGE 3-10)
Q405
MUTE
IC401 DSB
CHARACTER GENERATOR
V SYNC
CHRSYN
CO CS
XTAL OSC
LC OSC
XB
EXB
S CLK
S IN
X401 17.7MHz
V SYNC (Q402 ③)
SERVO/ SYSTEM CONTROL
SI BUS
S CLK
CO CS
V SYNC
Y SEP
COUNT DOWN
LOCK SET
H SET
SYNC SEP
AFC
32FH VCO
X402 500kHz
IC402
CO AFC
Q406
BUFFER
Q407
MUTE
POWER CONT1
IC402⑩REC/PB 0.7Vp-p(500kHz)
IC501
VIDEO INPUT SELECTOR
L3/L4
L1
L2
TU
SERVO/ SYSTEM CONTROL
L1 CONT (IC201 ㉜)
L2 CONT (IC201 ㉝)
V PB (IC201 ㉟)
(SEE PAGE 3-10)
Q502, 503
12V
SERVO/ SYSTEM CONTROL
AV CONT (IC201 ㉙)
(SEE PAGE 3-10)
CJ502
LINE OUT2
VIDEO
CN-92 BOARD (SEE PAGE 4-26)
(LINE IN4)
CN202
LINE IN4
VIDEO
CJ201
CN802
CP-71 BOARD (CANAL+)
(SEE PAGE 4-24)
IC801
CJ801
LINE IN3
V IN
CN501
CN801
CN201
CN851
SERVO/ SYSTEM CONTROL
L3 CONT (IC201 ㉝)
(SEE PAGE 3-10)
RF701
MOD V
ANTENNA OUT
EXCEPT UX MODEL
CN502
CN101
AV VIDEO IN
YC VIDEO IN
BUFFER
Q701
Q702, 703
BUFFER
JR514
UX MODEL
TU VIDEO OUT
AV VIDEO OUT
JR517
UX MODEL
TUNER
TU VIDEO (TU0701 ⑰)
TU VIDEO IN
(SEE PAGE 3-16)
IC101
OUT2
OUT1
OUT3
IN4
IN1
IN2
IN3
CK IN
D IN
S2
S3
S4
S6
AUDIO I/O
Q704
(SEE PAGE 3-14)
CJ775
CANAL+
V OUT
V IN
R
G
B
I
AV CONT
IC505
DRIVER
CN502
CN701
I CONT
CN702
C+ CLK
C+ DATA
C+ SET
TIMER/ TUNER CONTROL
C+ CLK (IC102 ㉕)
C+ DATA (IC102 ㉖)
C+ SET (IC102 ㉗)
(SEE PAGE 3-12)
CJ501
EURO-AV
MF-271 BOARD
(SEE PAGE 4-33)
CN904
CN101
L2 (V) IN
CNJ101
VIDEO
LINE IN2
CN905
V SYNC
H SET
CO CS
POWER CONT1
S CLK
SI BUS
TIMER/ TUNER/ MODE CONTROL
(SEE PAGE 3-12)

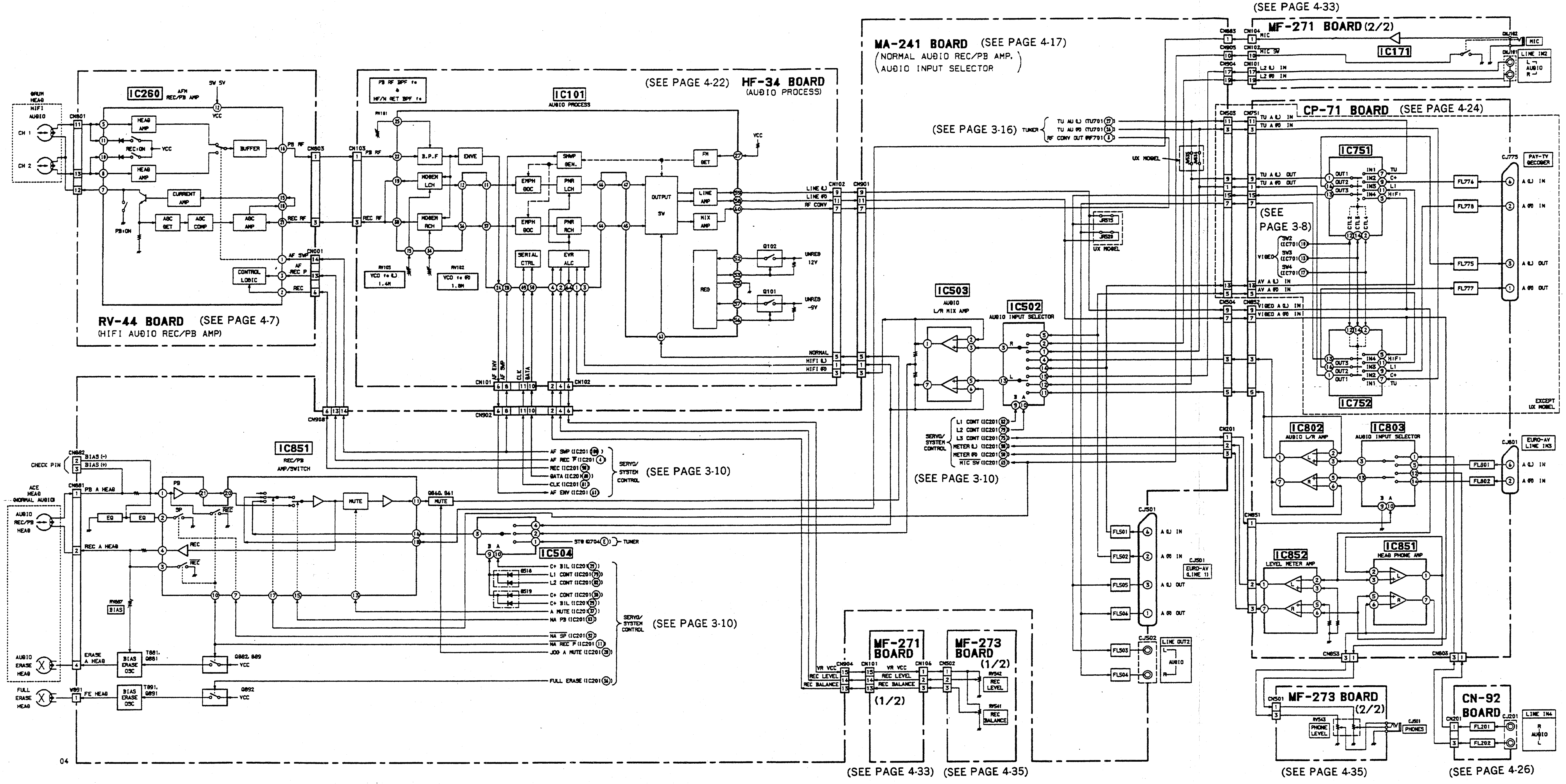
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM


MA-241 BOARD (SERVO/SYSTEM CONTROL)
(SEE PAGE 4-13)
(SEE PAGE 4-16)
M901 DRUM MOTOR (1/2)
DC-66 BOARD (RELAY)
M902 CAPSTAN MOTOR (1/2)
IC101 (1/3) WAVE SHAPER
IC101 (2/3) CAPSTAN FG AMP
IC101 (3/3) CTL REC/PB AMP
IC201 (1/2) SERVO CONTROL
IC251 (1/2) DRUM ERROR INTEGRATOR
IC251 (2/2) CAPSTAN ERROR INTEGRATOR
IC201 (69) REC/PB 4.5Vp-p(V)
IC201 (49) REC/PB 5Vp-p(300Hz)
IC201 (70) REC/PB 5Vp-p(1.515kHz)
IC201 (7) REC 5Vp-p(V)
IC201 (1) REC/PB 5Vp-p(V)
IC201 (57) PB 5.0Vp-p(V)
DRUM PG
DRUM FG
CAP FG
CTL INDEX
CTL REC
REC CTL
PB CTL
CTL STEP
REC CTL AMP
TIMING GEN
3 VALUE DET
OPEN PB
PB CTL AMP
GCA
LEVEL DET
PB CTL LOGIC
PEAK DET
RTG MMV
BIAS 2.4V
FOR CHECK
ACE HEAD
CTL HEAD
AF SW POS
RF SW POS
RV201 AF SWITCHING POSITION
RV202 RF SWITCHING POSITION
RF SWP
(SEE PAGE 3-7)
M901 DRUM MOTOR (2/2)
OUTPUT
MATRIX
HALL DEVICE
M902 CAPSTAN MOTOR (2/2)
IC1
CAPSTAN MOTOR
MTR 12V
SW 5V
IC201 (42) REC/PB 4.5Vp-p(16MHz)
IC351 SYNC SERIAL BUS TO PARALLEL
SWITCH
DIVIDE
ADDRESS DECODER
OUTPUT LATCH REGISTER
TAIL MARK COUNTER
DATA SHIFT REGISTER
ADDRESS SHIFT REGISTER
CLOCK GATE
IC201 (2/2) SYSTEM CONTROL
IC201 (60) REC/PB 3.5Vp-p(H)
XTAL
EXTAL
S002 REC PROOF
IC071 CAM MOTOR DRIVE
M903 LOAD MOTOR
ROTARY SWITCH (CAM ENCODER)
MODE1
MODE2
MODE3
MODE4
D003 LED DRIVE
END LED
IC002 (1/2) TAPE END DETECT
Q001 TAKE UP END SENSOR
Q002 SUPPLY END SENSOR
D001 TAPE LED
T SENS
S SENS
IC002 (2/2) REEL FG AMP
PH002 T REEL FG
PH001 T REEL FG
T REEL FG
S REEL FG
(SEE PAGE 3-15)
MOD CONT
TUNER
LP HEAD
HEAD CONT
REC P
RF ENV
V SP
V SYNC
REC
RF SWP
AF REC P
AF SWP
FE ON
SHARPNESS
L3 CONT
JOG
LP
ORC SETTEI
YNR
EDIT
QVD
NTSC
SECAM
HEAD SEL
SKEW ON
PAL 60
ME SECAM
VIDEO
(SEE PAGE 3-7)
(SEE PAGE 3-8)
OSD MUTE
AV CONT
LINE1
LINE2
VPB
NAPB
NA REC P
L3 CONT
NA SP
C+ CONT
C+ DIL
JOG A MUTE
FULL ERASE
AUDIO
(SEE PAGE 3-13, 3-14)
MIC SW
A MUTE
AF ENV
DATA
CLK
METER (L)
METER (R)
ASURA RESET
ASURA CS
SI BUS
SO BUS
SCLK
TIMER/TUNER/MODE CONTROL
(SEE PAGE 3-12)

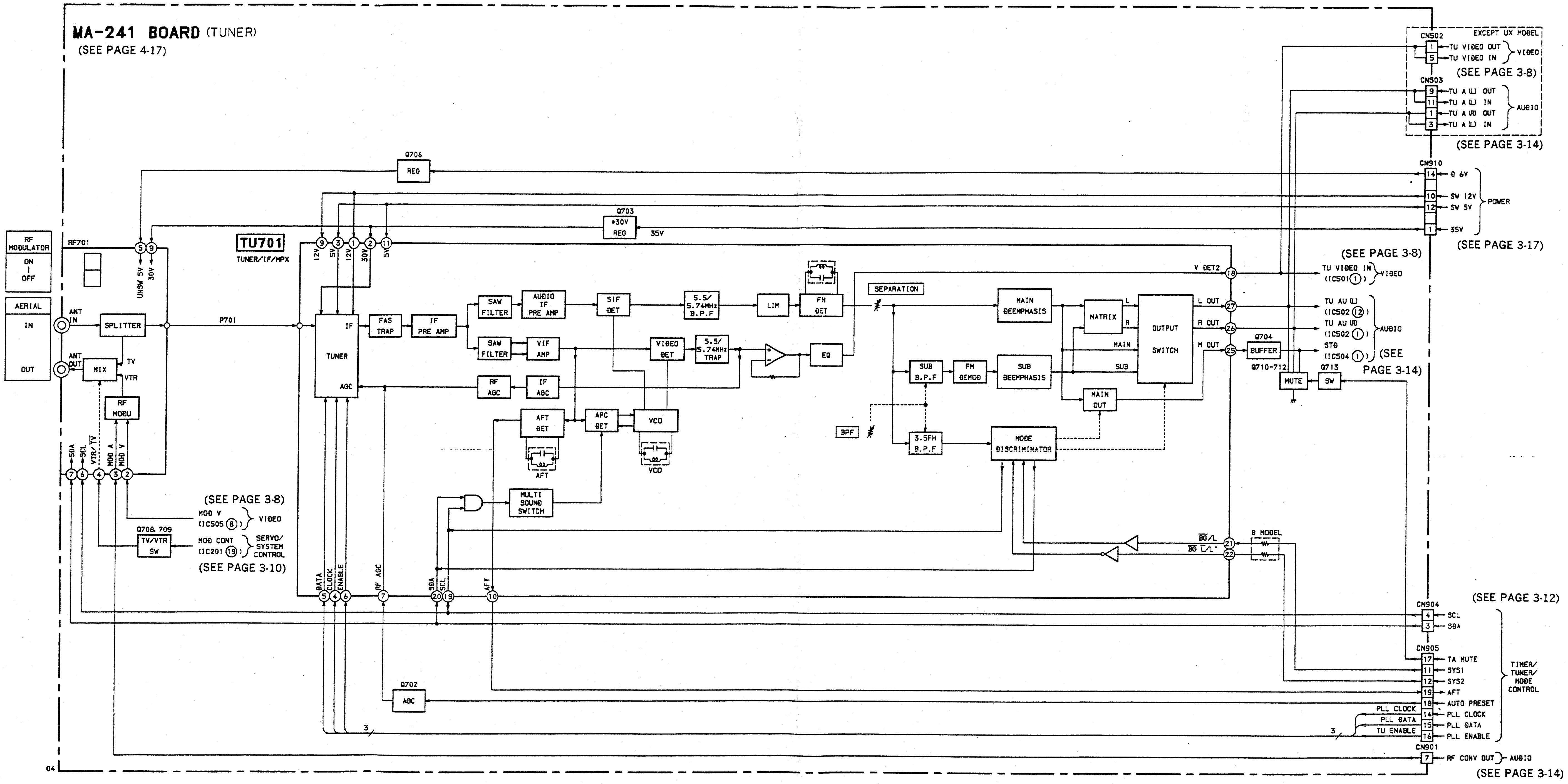
3-4. TIMER/TUNER/MODE CONTROL BLOCK DIAGRAM


CONTROL SWITCH BLOCK (SEE PAGE 4-36)
MF-272 BOARD (SEE PAGE 4-35)
(MODE/LCD CONTROL)
MF-271 BOARD (TIMER/TUNER CONTROL)
(SEE PAGE 4-33)
(SEE PAGE 4-34)
PL-27 BOARD
(LCD BACK LIGHT)
(SEE PAGE 4-13)
MA-241 BOARD
(SEE PAGE 3-16)
(SEE PAGE 3-17)
(SEE PAGE 3-8)
(SEE PAGE 3-10)
(SEE PAGE 4-28)
PV-17 BOARD
(PDC/VPS CONTROL)
IC652
IC651
(SEE PAGE 3-16)
(SEE PAGE 3-8)
(SEE PAGE 4-24)
CP-71 BOARD
(SEE PAGE 3-8)
IC652㉙REC/PB 5.0Vp-p(8MHz)
IC301
IC102
IC104
IC103
IC101
IC151
IC301②REC/PB 4.0Vp-p(32kHz)
IC301⑤REC/PB 4.0Vp-p(12MHz)
IC102②REC/PB 4.0Vp-p(32kHz)
IC102⑤REC/PB 4.0Vp-p(12MHz)
PS-345 BOARD
IC141
(SEE PAGE 4-39)

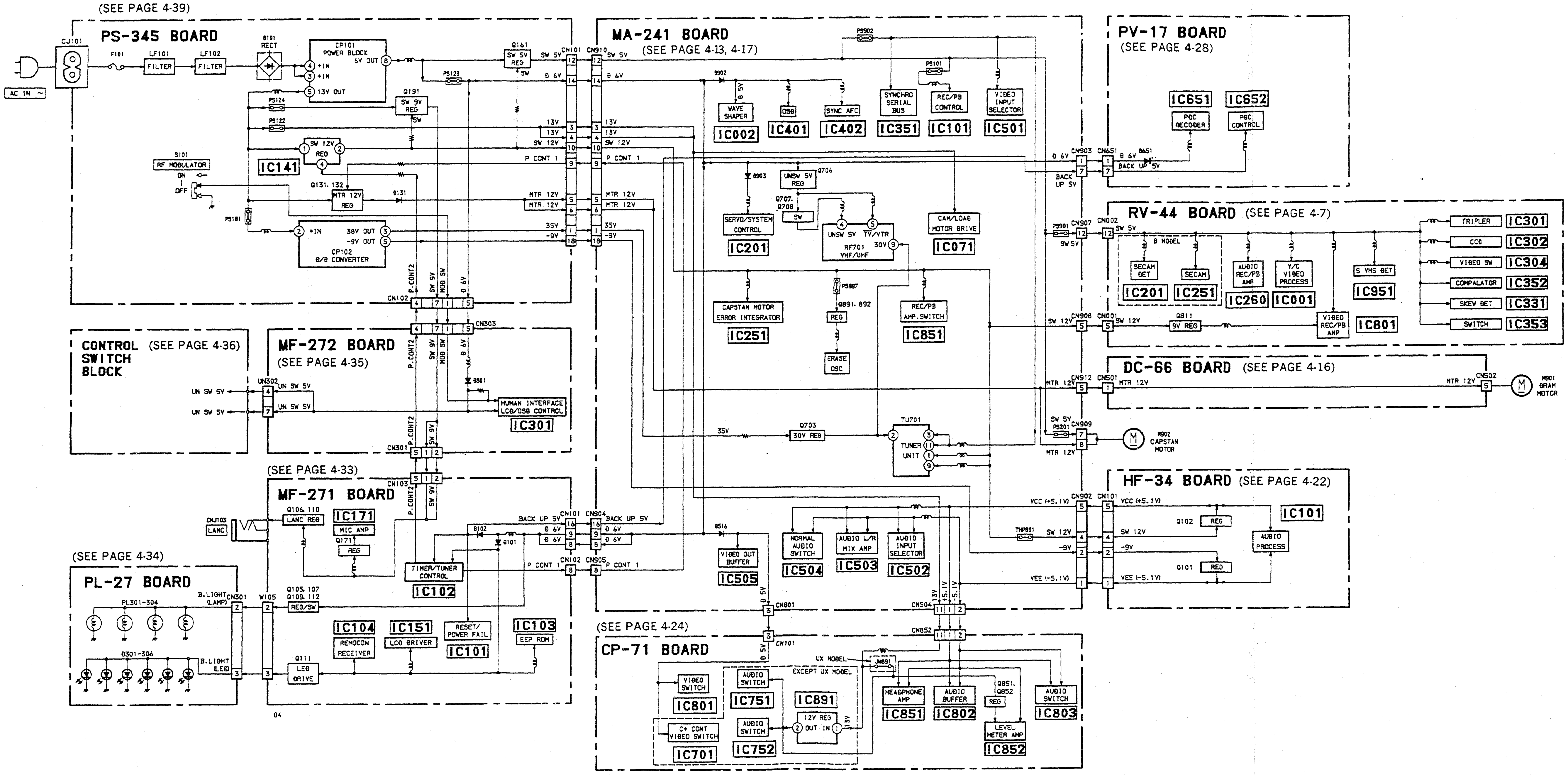
3-5. AUDIO BLOCK DIAGRAM


RV-44 BOARD (SEE PAGE 4-7)
(HIFI AUDIO REC/PB AMP)
IC260 AFM REC/PB AMP
HF-34 BOARD (SEE PAGE 4-22)
(AUDIO PROCESS)
IC101 AUDIO PROCESS
MA-241 BOARD (SEE PAGE 4-17)
(NORMAL AUDIO REC/PB AMP, AUDIO INPUT SELECTOR)
MF-271 BOARD (2/2) (SEE PAGE 4-33)
IC171
CP-71 BOARD (SEE PAGE 4-24)
IC751
IC752
IC503 AUDIO L/R MIX AMP
IC502 AUDIO INPUT SELECTOR
IC802 AUDIO L/R AMP
IC803 AUDIO INPUT SELECTOR
IC851 REC/PB AMP/SWITCH
IC504
IC852 LEVEL METER AMP
IC851 HEAD PHONE AMP
MF-271 BOARD (1/2)
MF-273 BOARD (1/2)
MF-273 BOARD (2/2)
CN-92 BOARD
(SEE PAGE 3-16)
(SEE PAGE 3-8)
(SEE PAGE 3-10)
(SEE PAGE 3-10)
(SEE PAGE 3-10)
(SEE PAGE 4-33)
(SEE PAGE 4-35)
(SEE PAGE 4-35)
(SEE PAGE 4-26)
DRUM HEAD HIFI AUDIO
CH 1
CH 2
ACE HEAD (NORMAL AUDIO)
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
CHECK PIN
BUFFER
B.P.F
ENVE
NOISE LCH
NOISE RCH
EMPH DOC
PNR LCH
PNR RCH
SWP GEN.
OUTPUT 5V
LINE AMP
MIX AMP
FM DET
SERIAL CTRL
EVR ALC
MUTE
EQ
BIAS ERASE OSC
PAY-TV DECODER
EURO-AV LINE IN3
EURO-AV (LINE 1)
LINE OUT2
LINE IN2
LINE IN4
MIC
PHONES
PHONE LEVEL
REC LEVEL
REC BALANCE
EXCEPT UX MODEL
UX MODEL
04

3-6. TUNER BLOCK DIAGRAM

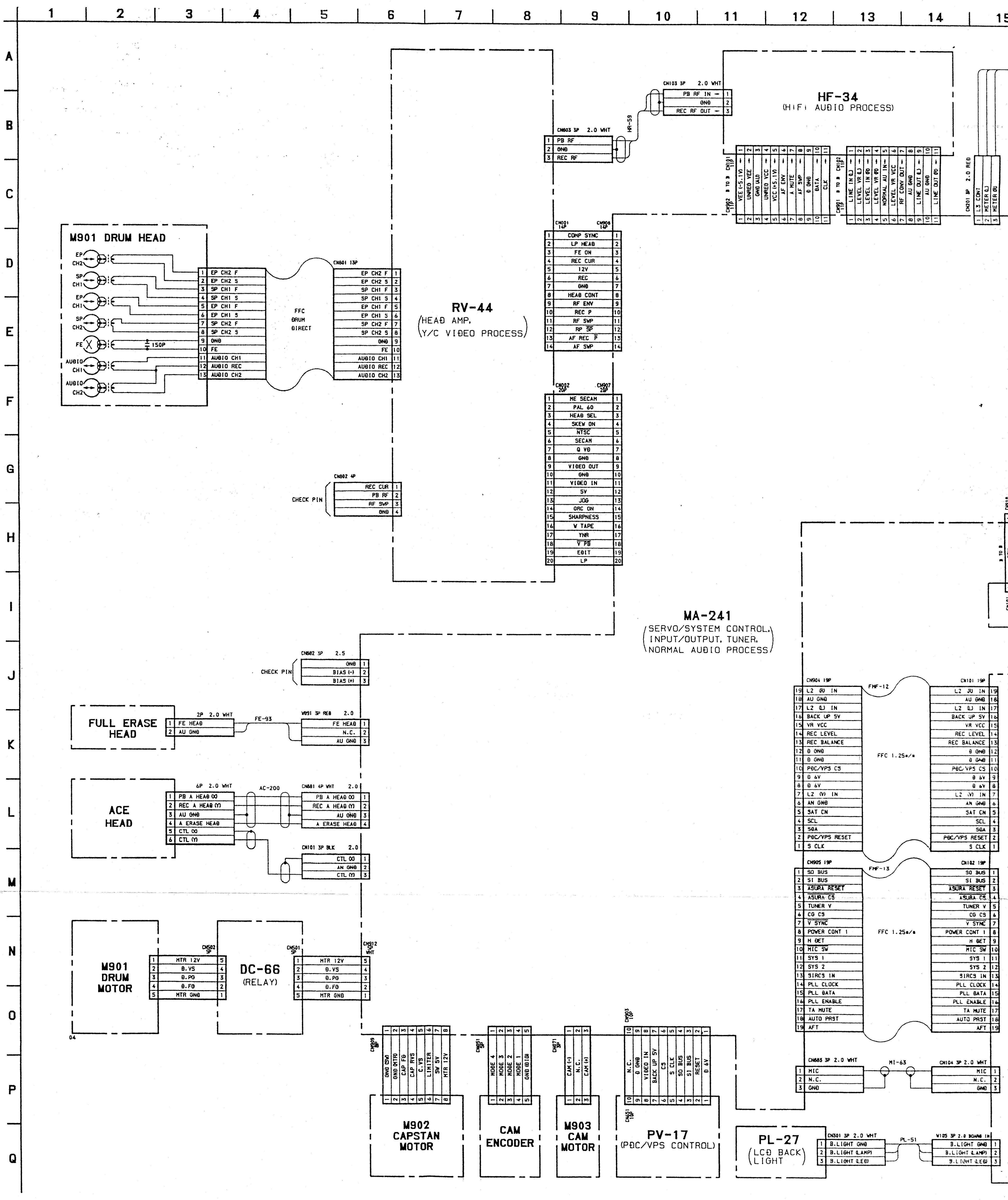

MA-241 BOARD (TUNER)
(SEE PAGE 4-17)
RF MODULATOR
ON
OFF
AERIAL
IN
OUT
RF701
ANT IN
ANT OUT
SPLITTER
MIX
TV
VTR
RF MODU
UNSW 5V
30V
P701
SDA
SCL
VTR/TV
MOD A
MOD V
(SEE PAGE 3-8)
MOD V (IC505 ⑧)
VIDEO
Q708, 709
TV/VTR SW
MOD CONT (IC201 ⑲)
SERVO/SYSTEM CONTROL
(SEE PAGE 3-10)
Q706
REG
Q703
+30V REG
35V
TU701
TUNER/IF/MPX
12V
5V
12V
30V
5V
TUNER
IF
AGC
FAS TRAP
IF PRE AMP
SAW FILTER
AUDIO IF PRE AMP
SAW FILTER
VIF AMP
SIF DET
5.5/5.74MHz B.P.F
VIDEO DET
5.5/5.74MHz TRAP
LIM
FM DET
EQ
RF AGC
IF AGC
AFT DET
AFT
APC DET
VCO
MULTI SOUND SWITCH
SEPARATION
BPF
SUB B.P.F
FM DEMOD
SUB DEEMPHASIS
3.5FH B.P.F
MODE DISCRIMINATOR
MAIN DEEMPHASIS
MATRIX
L
R
MAIN
SUB
MAIN OUT
OUTPUT SWITCH
V DET2
L OUT
R OUT
M OUT
Q704
BUFFER
Q710-712
MUTE
Q713
SW
BG/L
BG L/L'
B MODEL
DATA
CLOCK
ENABLE
RF AGC
SDA
SCL
AFT
Q702
AGC
3
(SEE PAGE 3-8)
TU VIDEO IN (IC501 ①)
VIDEO
TU AU (L) (IC502 ⑫)
TU AU (R) (IC502 ①)
AUDIO
STD (IC504 ①)
(SEE PAGE 3-14)
CN502
EXCEPT UX MODEL
TU VIDEO OUT
TU VIDEO IN
VIDEO
(SEE PAGE 3-8)
CN503
TU A (L) OUT
TU A (L) IN
TU A (R) OUT
TU A (L) IN
AUDIO
(SEE PAGE 3-14)
CN910
D 6V
SW 12V
SW 5V
35V
POWER
(SEE PAGE 3-17)
CN904
SCL
SDA
(SEE PAGE 3-12)
CN905
TA MUTE
SYS1
SYS2
AFT
AUTO PRESET
PLL CLOCK
PLL DATA
PLL ENABLE
TU ENABLE
TIMER/TUNER/MODE CONTROL
CN901
RF CONV OUT
AUDIO
(SEE PAGE 3-14)
04

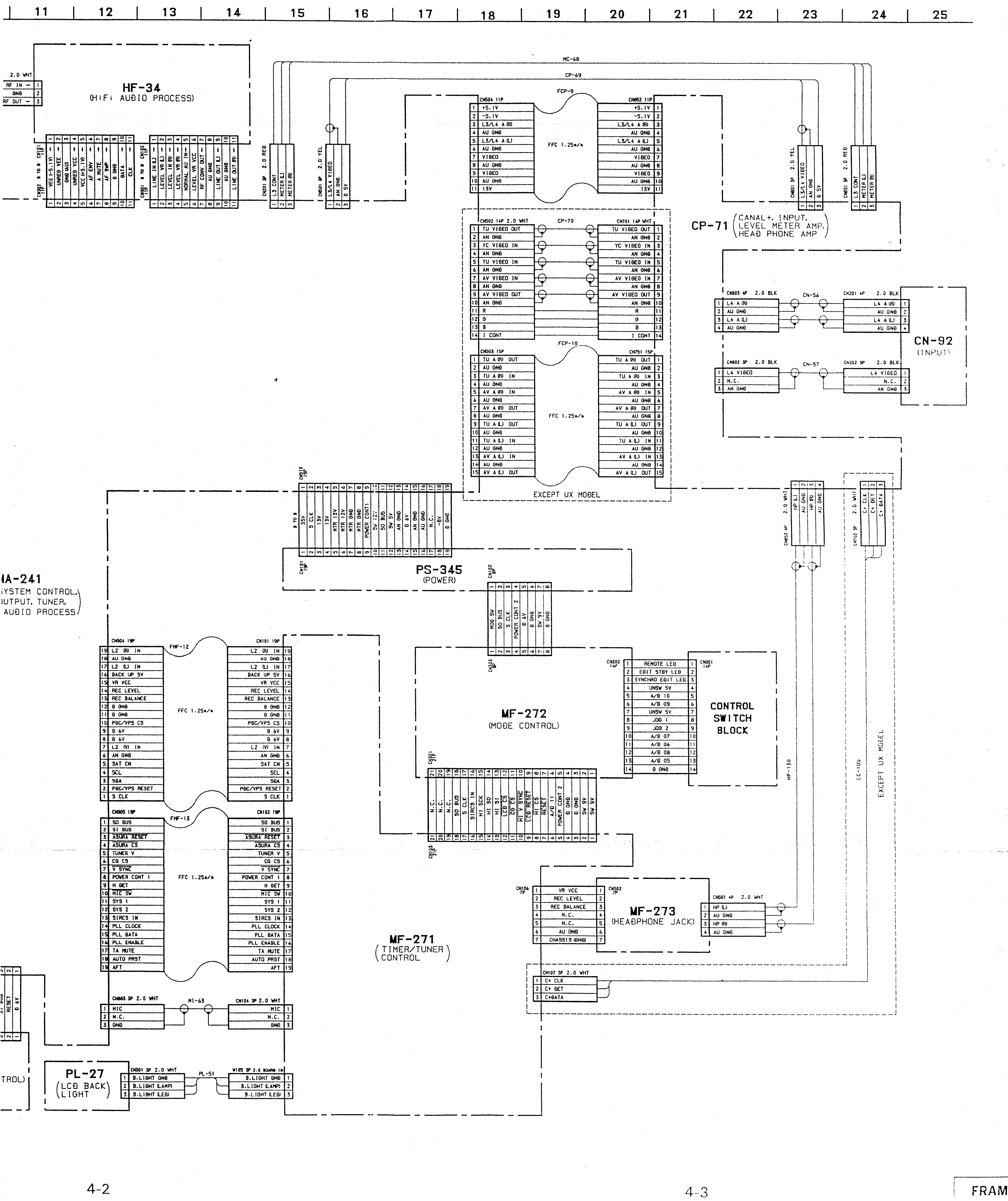
3-7. POWER BLOCK DIAGRAM


(SEE PAGE 4-39)
PS-345 BOARD
CJ101
AC IN ~
F101
LF101 FILTER
LF102 FILTER
D101 RECT
CP101 POWER BLOCK
+IN
6V OUT
13V OUT
Q161 SW 5V REG
Q191 SW 9V REG
SW 12V REG
IC141
S101 RF MODULATOR ON OFF
Q131, 132 MTR 12V REG
CP102 D/D CONVERTER
38V OUT
-9V OUT
PS123
PS124
PS122
PS181
D131
SW 5V
D 6V
13V
SW 12V
P CONT 1
MTR 12V
35V
-9V
CN101
CN910
CN102
P.CONT2
UN SW 5V
CONTROL SWITCH BLOCK
(SEE PAGE 4-36)
MF-272 BOARD
(SEE PAGE 4-35)
CN303
UN302
D301
HUMAN INTERFACE LCD/DSD CONTROL
IC301
CN301
(SEE PAGE 4-33)
MF-271 BOARD
CN103
CNJ103 LANC
Q106, 110 LANC REG
IC171 MIC AMP
Q171 REG
D102
D101
BACK UP 5V
TIMER/TUNER CONTROL
IC102
Q105, 107 Q109, 112 REG/SW
IC104 REMOCON RECEIVER
IC151 LCD DRIVER
RESET/ POWER FAIL
IC101
IC103 EEP ROM
Q111 LED DRIVE
W105
(SEE PAGE 4-34)
PL-27 BOARD
PL301-304
B.LIGHT (LAMP)
D301-306
B.LIGHT (LED)
MA-241 BOARD
(SEE PAGE 4-13, 4-17)
PS902
PS101
D902
WAVE SHAPER
IC002
DSD
IC401
SYNC AFC
IC402
SYNCHRO SERIAL BUS
IC351
REC/PB CONTROL
IC101
VIDEO INPUT SELECTOR
IC501
D903
UNSW 5V REG
Q706
Q707, Q708
SERVO/SYSTEM CONTROL
IC201
SW
UNSW 5V TV/VTR
RF701 VHF/UHF
CAM/LOAD MOTOR DRIVE
IC071
CAPSTAN MOTOR ERROR INTEGRATOR
IC251
PS887
Q891, 892 REG
ERASE OSC
REC/PB AMP. SWITCH
IC851
Q703 30V REG
TU701 TUNER UNIT
D516
VIDEO OUT BUFFER
IC505
NORMAL AUDIO SWITCH
IC504
AUDIO L/R MIX AMP
IC503
AUDIO INPUT SELECTOR
IC502
CN903
CN907
CN908
CN912
CN909
CN902
CN904
CN905
CN504
PS201
THP801
VCC (+5.1V)
VEE (-5.1V)
PV-17 BOARD
(SEE PAGE 4-28)
IC651 PBC DECODER
IC652 PBC CONTROL
CN651
D651
BACK UP 5V
RV-44 BOARD (SEE PAGE 4-7)
CN002
B MODEL
SECAM DET
IC201
SECAM
IC251
AUDIO REC/PB AMP
IC260
Y/C VIDEO PROCESS
IC001
S VHS DET
IC951
TRIPLER IC301
CCD IC302
VIDEO SW IC304
COMPALATOR IC352
SKEW DET IC331
SWITCH IC353
CN001
Q811 9V REG
VIDEO REC/PB AMP
IC801
DC-66 BOARD (SEE PAGE 4-16)
CN501
CN502
M901 DRAM MOTOR
M902 CAPSTAN MOTOR
HF-34 BOARD (SEE PAGE 4-22)
CN101
IC101 AUDIO PROCESS
Q102 REG
Q101 REG
(SEE PAGE 4-24)
CP-71 BOARD
CN801
CN852
CN101
UX MODEL
D891
EXCEPT UX MODEL
VIDEO SWITCH
IC801
AUDIO SWITCH
IC751
IC891
12V REG OUT IN
C+ CONT VIDEO SWITCH
IC701
AUDIO SWITCH
IC752
HEADPHONE AMP
IC851
AUDIO BUFFER
IC802
Q851, Q852 REG
LEVEL METER AMP
IC852
AUDIO SWITCH
IC803

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAMS


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
HF-34
(HiFi AUDIO PROCESS)
CN103 3P 2.0 WHT
PB RF IN
GND
REC RF OUT
HR-59
CN803 3P 2.0 WHT
PB RF
GND
REC RF
CN902 11P B TO B CN101 11P
VEE (-5.1V)
UNREG VEE
GND (AU)
UNREG VCC
VCC (+5.1V)
AF ENV
A MUTE
AF SWP
D GND
DATA
CLK
CN901 11P B TO B CN102 11P
LINE IN (L)
LEVEL VR (L)
LEVEL IN (R)
LEVEL VR (R)
NORMAL AU IN
LEVEL VR VCC
RF CONV OUT
AU GND
LINE OUT (L)
AU GND
LINE OUT (R)
CN201 3P 2.0 RED
L3 CONT
METER (L)
METER (R)
M901 DRUM HEAD
EP CH2
SP CH1
EP CH1
SP CH2
FE
150P
AUDIO CH1
AUDIO CH2
EP CH2 F
EP CH2 S
SP CH1 F
SP CH1 S
EP CH1 F
EP CH1 S
SP CH2 F
SP CH2 S
GND
FE
AUDIO CH1
AUDIO REC
AUDIO CH2
FFC DRUM DIRECT
CN801 13P
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
CN901 14P
CN906 14P
COMP SYNC
LP HEAD
FE ON
REC CUR
12V
REC
GND
HEAD CONT
RF ENV
REC P
RF SWP
RP SP
AF REC P
AF SWP
CN902 20P
CN907 20P
ME SECAM
PAL 60
HEAD SEL
SKEW ON
NTSC
SECAM
Q VD
GND
VIDEO OUT
GND
VIDEO IN
SV
JOG
ORC ON
SHARPNESS
V TAPE
YNR
V PB
EDIT
LP
CN802 4P
CHECK PIN
REC CUR
PB RF
RF SWP
GND
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER, NORMAL AUDIO PROCESS)
CN882 3P 2.5
CHECK PIN
GND
BIAS (-)
BIAS (+)
FULL ERASE HEAD
2P 2.0 WHT
FE HEAD
AU GND
FE-93
W891 3P RED 2.0
FE HEAD
N.C.
AU GND
ACE HEAD
6P 2.0 WHT
AC-200
PB A HEAD (L)
REC A HEAD (H)
AU GND
A ERASE HEAD
CTL (L)
CTL (H)
CN881 4P WHT 2.0
PB A HEAD (L)
REC A HEAD (H)
AU GND
A ERASE HEAD
CN101 3P BLK 2.0
CTL (L)
AN GND
CTL (H)
M901 DRUM MOTOR
CN502 5P
MTR 12V
D.VS
D.PG
D.FG
MTR GND
DC-66
(RELAY)
CN501 5P
CN912 5P WHT
MTR 12V
D.VS
D.PG
D.FG
MTR GND
04
CN904 19P
FMF-12
CN101 19P
L2 (R) IN
AU GND
L2 (L) IN
BACK UP 5V
VR VCC
REC LEVEL
REC BALANCE
D GND
D GND
PDC/VPS CS
D 6V
D 6V
L2 (V) IN
AN GND
SAT CN
SCL
SDA
PDC/VPS RESET
S CLK
FFC 1.25m/m
CN905 19P
FMF-13
CN102 19P
SO BUS
SI BUS
ASURA RESET
ASURA CS
TUNER V
CG CS
V SYNC
POWER CONT 1
H DET
MIC SW
SYS 1
SYS 2
SIRCS IN
PLL CLOCK
PLL DATA
PLL ENABLE
TA MUTE
AUTO PRST
AFT
FFC 1.25m/m
CN883 3P 2.0 WHT
MI-63
CN104 3P 2.0 WHT
MIC
N.C.
GND
CN909 8P
GND (SW)
GND (MTR)
CAP FG
CAP RVS
C.VS
LIMITER
SW 5V
MTR 12V
M902 CAPSTAN MOTOR
CN951 5P
MODE 4
MODE 3
MODE 2
MODE 1
GND (DIG)
CAM ENCODER
CN971 3P
CAM (-)
N.C.
CAM (+)
M903 CAM MOTOR
CN903 10P
N.C.
D GND
VIDEO IN
BACK UP 5V
CS
S CLK
SO BUS
SI BUS
RESET
D 6V
CN651 10P
PV-17
(PDC/VPS CONTROL)
PL-27
(LCD BACK LIGHT)
CN301 3P 2.0 WHT
B.LIGHT GND
B.LIGHT (LAMP)
B.LIGHT (LED)
PL-51
W105 3P 2.0 BOARD IN
B.LIGHT GND
B.LIGHT (LAMP)
B.LIGHT (LED)


11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
HF-34
(HIFi AUDIO PROCESS)
MC-68
CP-69
FCP-9
CN504 11P
CN852 11P
FFC 1.25m/m
CP-70
CN502 14P 2.0 WHT
CN701 14P WHT
CP-71
(CANAL+. INPUT. LEVEL METER AMP. HEAD PHONE AMP)
CN-56
CN-57
CN-92
(INPUT)
FCP-10
CN503 15P
CN751 15P
EXCEPT UX MODEL
PS-345
(POWER)
MA-241
SYSTEM CONTROL. OUTPUT. TUNER. AUDIO PROCESS
FMF-12
FMF-13
CN904 19P
CN101 19P
CN905 19P
CN102 19P
MF-272
(MODE CONTROL)
CONTROL SWITCH BLOCK
MF-273
(HEADPHONE JACK)
MF-271
(TIMER/TUNER CONTROL)
MI-63
PL-27
(LCD BACK LIGHT)
PL-51
HP-130
CC-105
EXCEPT UX MODEL

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is is printed in each block.)

● For printed wiring boards.

- ○ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side. *
- Circled numbers refer to waveforms.

● For schematic diagram.

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
- Chip resistor are 1/8W or 1/10W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair. *
- ━━ : B + Line. *
- - - - : B – Line. *
- ⇨ : IN/OUT direction of (+, –) B line. *
- Circled numbers refer to waveforms. *
- Voltages are dc between ground and measurement points. *
- Readings are taken with a color-bar signal input. *
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *

Extension cable
①MF-271 Board
- MF-271 board CN101–MA-241 board CN904
  Part No : J-6090-053-A (19 pin)

②RV-44 Board
- RV-44 board CN001–MA-241 board CN908
  Part No : J-6090-025-A (14 pin)
- RV-44 board CN002–MA-241 board CN907
  Part No : J-6090-043-A (20 pin)
- RV-44 board CN801–Drum head flexible
  Part No : J-6090-054-A (13 pin)

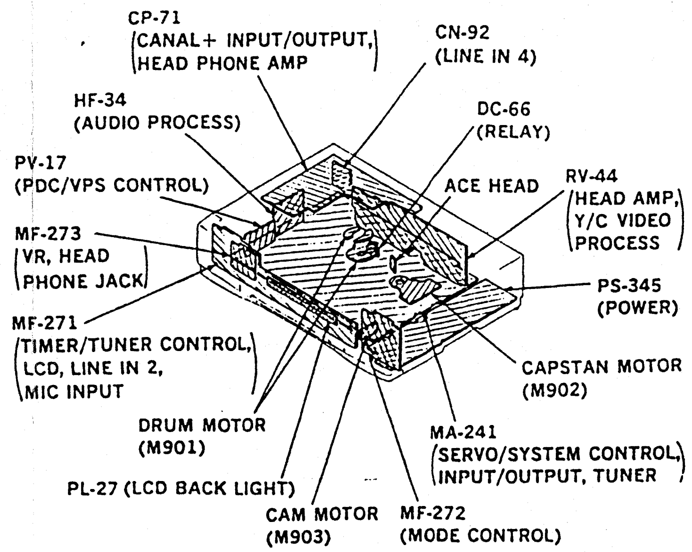
③HF-34 Board
- HF-34 board CN101–MA-241 board CN902
- HF-34 board CN102–MA-241 board CN901
  Part No : J-6090-047-A (11 pin)

④PV-17 Board
- PV-17 board CN651–MA-241 board CN903
  Part No : J-6090-048-A (10 pin)

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

*: indicated by the color red.


CP-71
(CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
MF-273
(VR, HEAD PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)

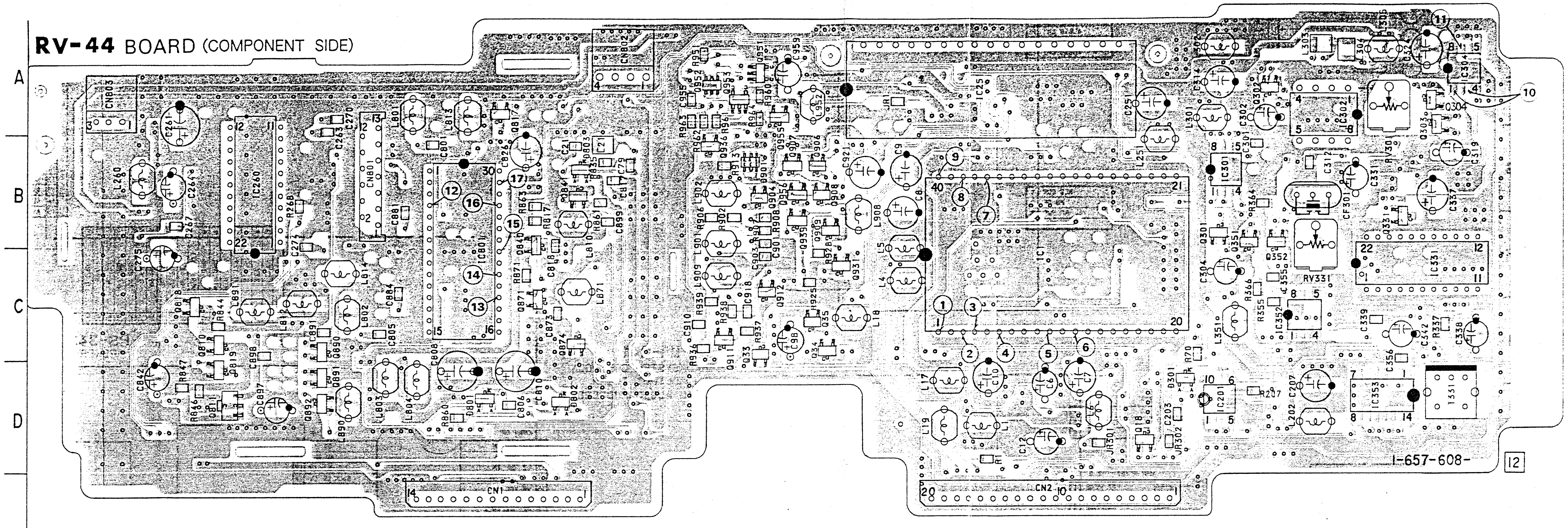
CAM MOTOR MF-272
(M903) (MODE CONTROL)

● There are few cases that the part isn't mounted in this model is printed on this diagram.

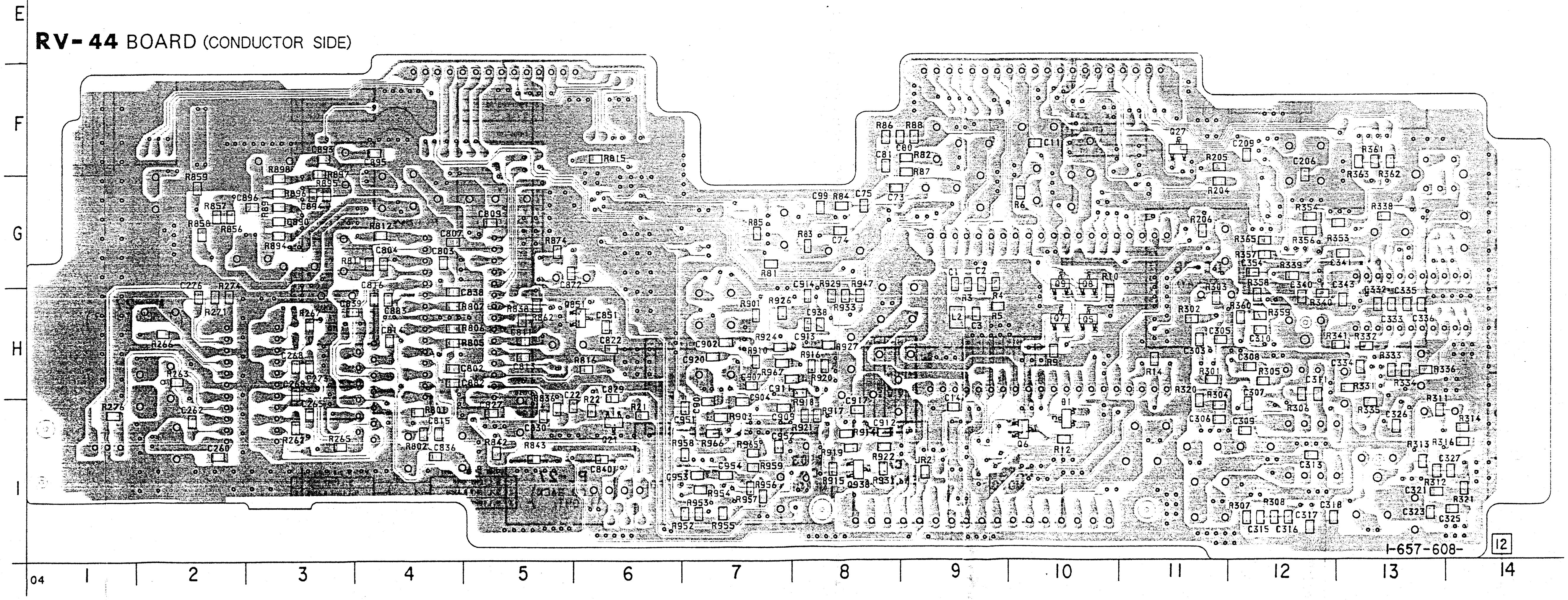
RV-44 (HEAD AMP, Y/C VIDEO PROCESS) PRINTED WIRING BOARD

— Ref. No. RV-44 BOARD : 2,000 series —

RV-44 BOARD (COMPONENT SIDE)

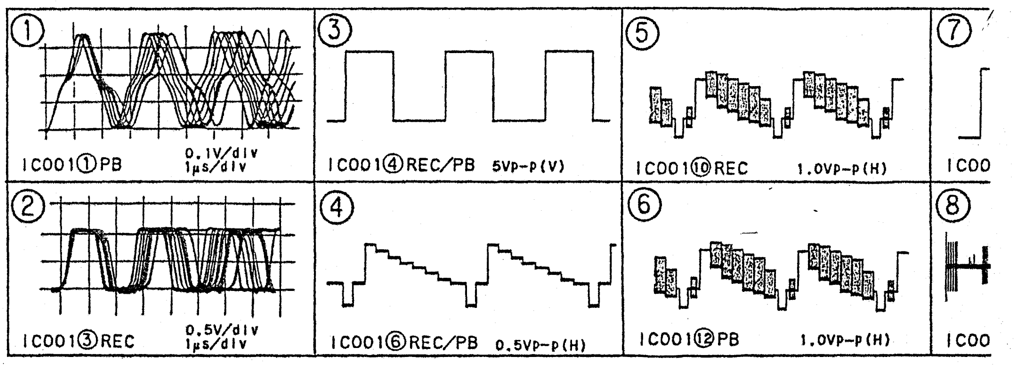

A
B
C
D
CN803
IC260
CN801
IC801
CN802
IC251
IC1
IC301
IC302
IC304
IC331
IC352
IC353
IC201
RV331
CF301
CN1
CN2
1-657-608-
12

RV-44 BOARD (CONDUCTOR SIDE)


E
F
G
H
I
04
1
2
3
4
5
6
7
8
9
10
11
12
13
14
1-657-608-
12

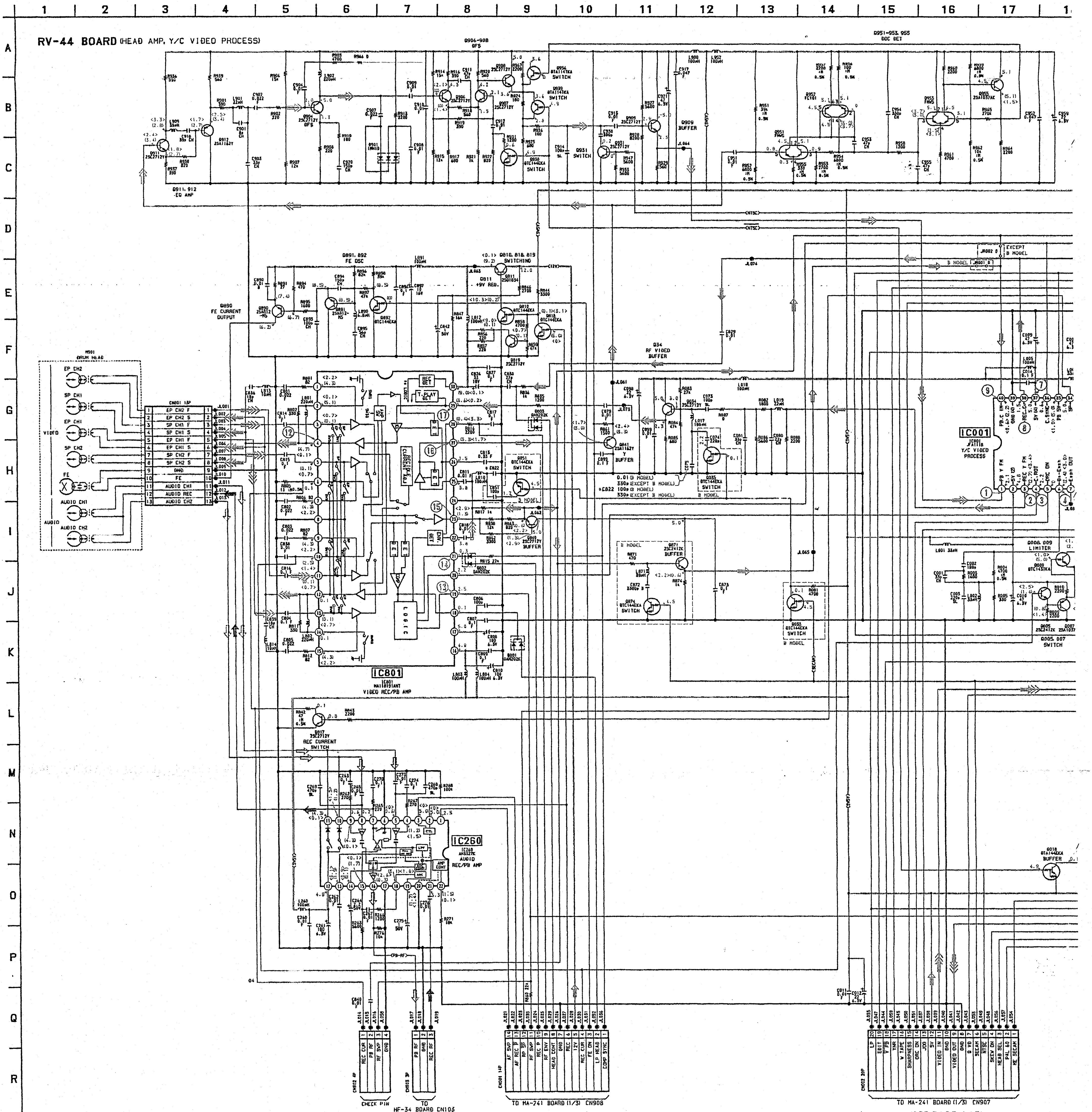
RV-44 BOARD	
D1	I-10
D301	D-11
D801	D-5
D802	D-5
D803	B-5
D901	B-7
IC1	C-9
IC201	D-11
IC251	A-9
IC260	B-3
IC301	B-11
IC302	B-12
IC304	A-13
IC331	C-13
IC352	C-12
IC353	D-13
IC801	B-5
Q5	H-10
Q6	I-10
Q7	H-10
Q8	H-10
Q9	H-10
Q18	D-11
Q27	F-11
Q33	C-7
Q34	C-8
Q35	C-8
Q301	B-11
Q302	A-12
Q303	A-13
Q304	A-13
Q331	B-13
Q351	C-12
Q352	C-12
Q810	C-2
Q811	D-2
Q817	A-5
Q818	C-2
Q819	D-2
Q840	B-5
Q841	B-5
Q851	H-6
Q871	C-5
Q874	C-5
Q890	C-3
Q891	D-3
Q892	D-3
Q904	B-7
Q906	B-8
Q907	B-7
Q908	B-8
Q909	B-8
Q911	D-7
Q912	C-7
Q931	C-8
Q938	I-8
Q939	B-7
Q951	A-7
Q952	A-7
Q953	A-7
Q955	B-7
Q956	B-7

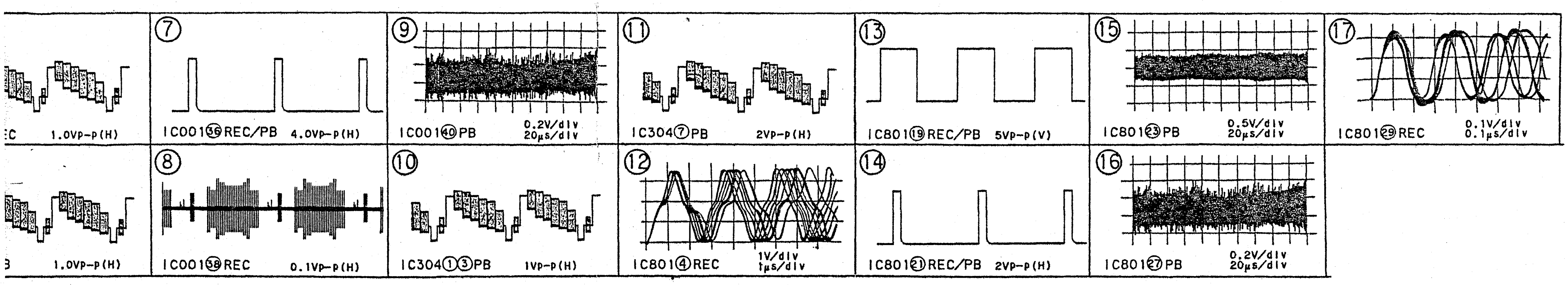
RV-44 BOARD

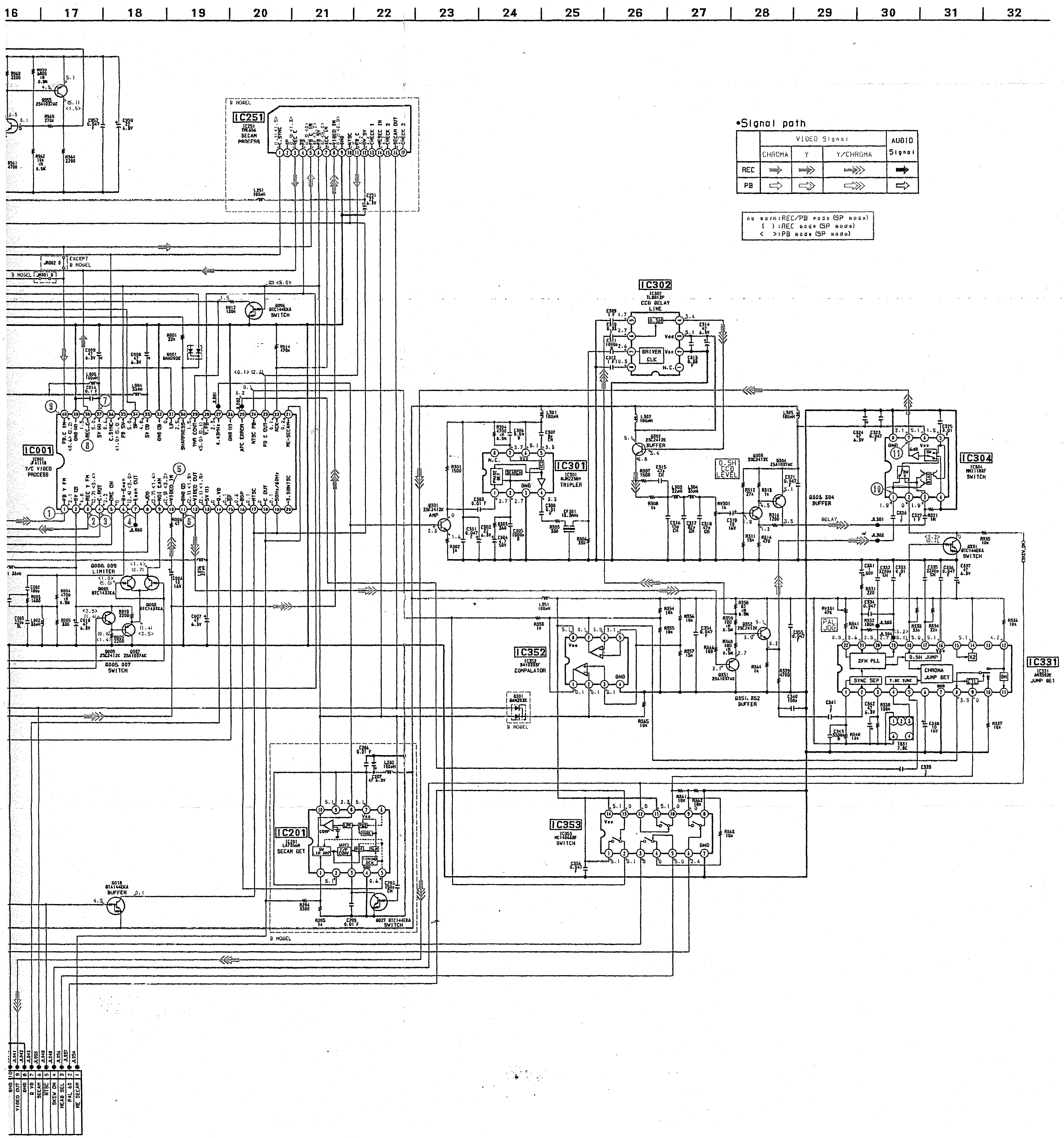


RV-44 (HEAD AMP, Y/C VIDEO PROCESS) SCHEMATIC DIAGRAM

—Ref. No. RV-44 BOARD : 2,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
RV-44 BOARD (HEAD AMP, Y/C VIDEO PROCESS)
Q906-908 BFS
Q951-953, 955 DOC DET
Q911, 912 EQ AMP
Q909 BUFFER
Q931 SWITCH
Q930 SWITCH
Q891, 892 FE OSC
Q816, 818, 819 SWITCHING
Q811 +9V REG.
Q890 FE CURRENT OUTPUT
Q34 RF VIDEO BUFFER
M901 DRUM HEAD
VIDEO
AUDIO
EP CH2
SP CH1
EP CH1
SP CH2
FE
AUDIO CH1
AUDIO CH2
CN801 13P
EP CH2 F
EP CH2 S
SP CH1 F
SP CH1 S
EP CH1 F
EP CH1 S
SP CH2 F
SP CH2 S
GND
FE
AUDIO CH1
AUDIO REC
AUDIO CH2
IC801
IC801 MA11819IANT VIDEO REC/PB AMP
REC DET
T.PLAY DET
LOGIC
Q851 DTC144EKA SWITCH
Q849 2SC2712Y BUFFER
Q841 2SA1162Y Y BUFFER
Q835 DTC144EKA SWITCH B MODEL
Q871 2SK241K BUFFER
Q874 DTC144EKA SWITCH
Q833 DTC144EKA SWITCH B MODEL
IC001
IC001 AX1118 Y/C VIDEO PROCESS
Q008, 009 LIMITER
Q005, 007 SWITCH
Q018 DTA144EKA BUFFER
Q817 2SC2712Y REC CURRENT SWITCH
IC260
IC260 AN3327K AUDIO REC/PB AMP
CN022 4P
REC CUR
PB RF
RF
GND
CHECK PIN
CN023 3P
PB RF
GND
REC RF
TO HF-34 BOARD CN105
(SEE PAGE 4-23)
CN001 14P
AF SVP
AF REC
RF SVP
RF SVP
REC P
RF ENV
HEAD CONT
HEAD SVP
REC
12V
FE ON
LP HEAD
COMP SYNC
TO MA-241 BOARD (1/3) CN908
(SEE PAGE 4-15)
CN002 20P
LP
EDIT
V PB
YNR
V TAPE
SHARPNESS
DRC ON
JOG
5V
VIDEO IN
GND
VIDEO OUT
GND
R VD
BREAK
SKEW ON
HEAD SEL
PAL 60
ME SECAM
TO MA-241 BOARD (1/3) CN907
(SEE PAGE 4-15)




16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
IC251
IC251 TEA2029 SECAM PROCESS
B MODEL
IC001
IC001 JFA1118 Y/C VIDEO PROCESS
Q006 DTC144EKA SWITCH
Q008, 009 LIMITER
Q005, 007 SWITCH
EXCEPT B MODEL
B MODEL
IC302
IC302 TL8812P CCD DELAY LINE
DRIVER CLK
IC301
IC301 NJM2234M TRIPLER
Q301 2SC2412K AMP
Q302 2SC2412K BUFFER
0.5H CCD LEVEL
Q303, 304 BUFFER
DELAY
IC304
IC304 MM1118XF SWITCH
Q331 DTC144EKA SWITCH
IC352
IC352 BA10393F COMPALATOR
Q351, 352 BUFFER
D301 DAN202K
B MODEL
PAL JOG
2FH PLL
0.5H JUMP
SYNC SEP
CHROMA JUMP DET
IC331
IC331 AN3502K JUMP DET
IC353
IC353 MC14066BF SWITCH
IC201
IC201 LA3504M SECAM DET
Q018 DTA144EKA BUFFER
Q027 DTC144EKA SWITCH
B MODEL
VIDEO OUT
GND
Q VD
SECAM
NTSC
SKEW ON
HEAD SEL
PAL 60
ME SECAM
RD (1/3) CN907

•Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

no mark:REC/PB mode (SP mode)
( ):REC mode (SP mode)
< >:PB mode (SP mode)

GE 4-15)

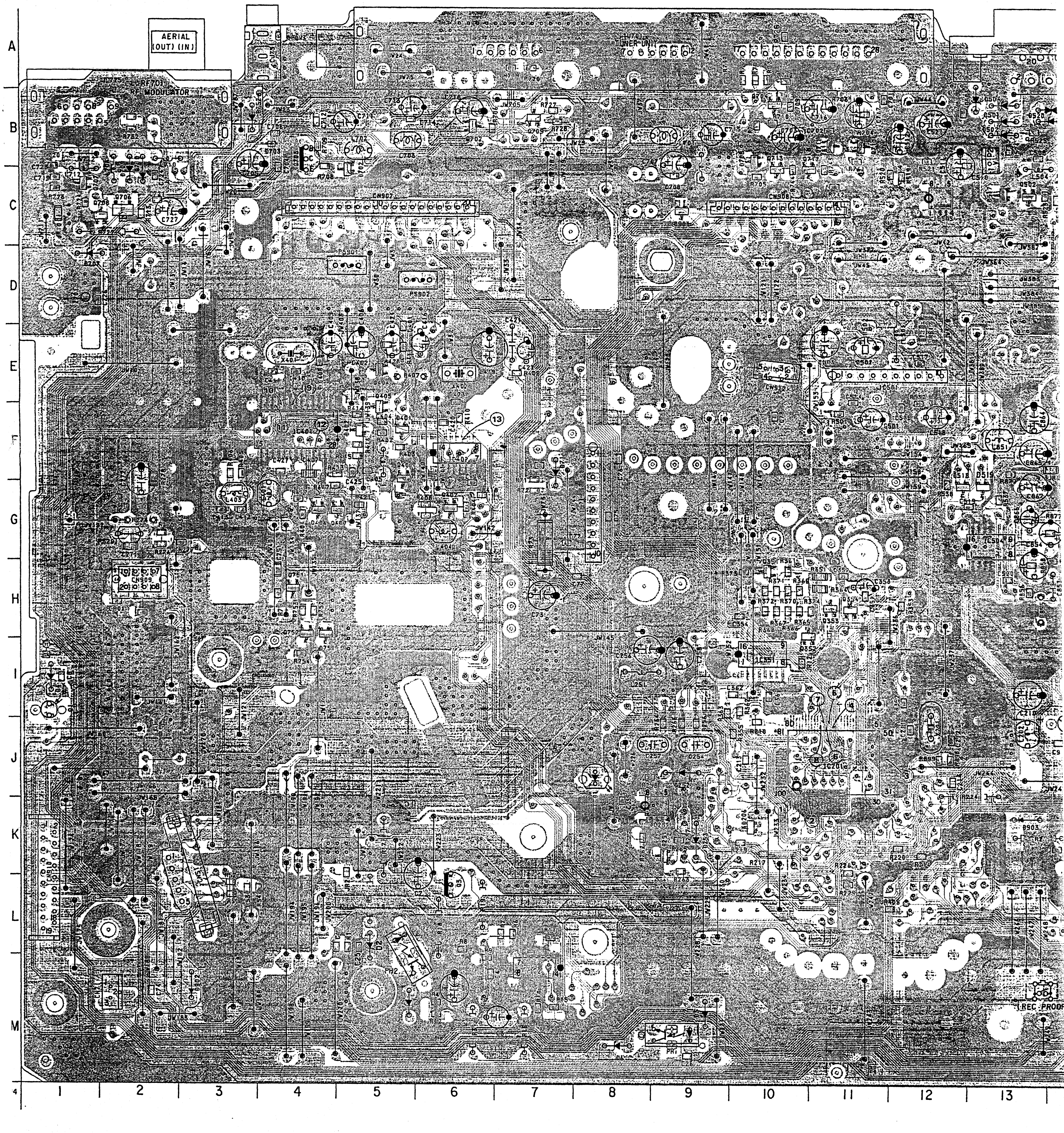
• There are few cases that the part
this model is printed on this diagra

MA-241 (SERVO/SYSTEM CONTROL, INPUT/OUTPUT, NORMAL AUDIO PROCESS, TUNER) DC-66 (RELAY) PRINTED WIRING BOARDS

— Ref. No. MA-241 BOARD : 1,000 series, DC-66 BOARD : 4,000 series —

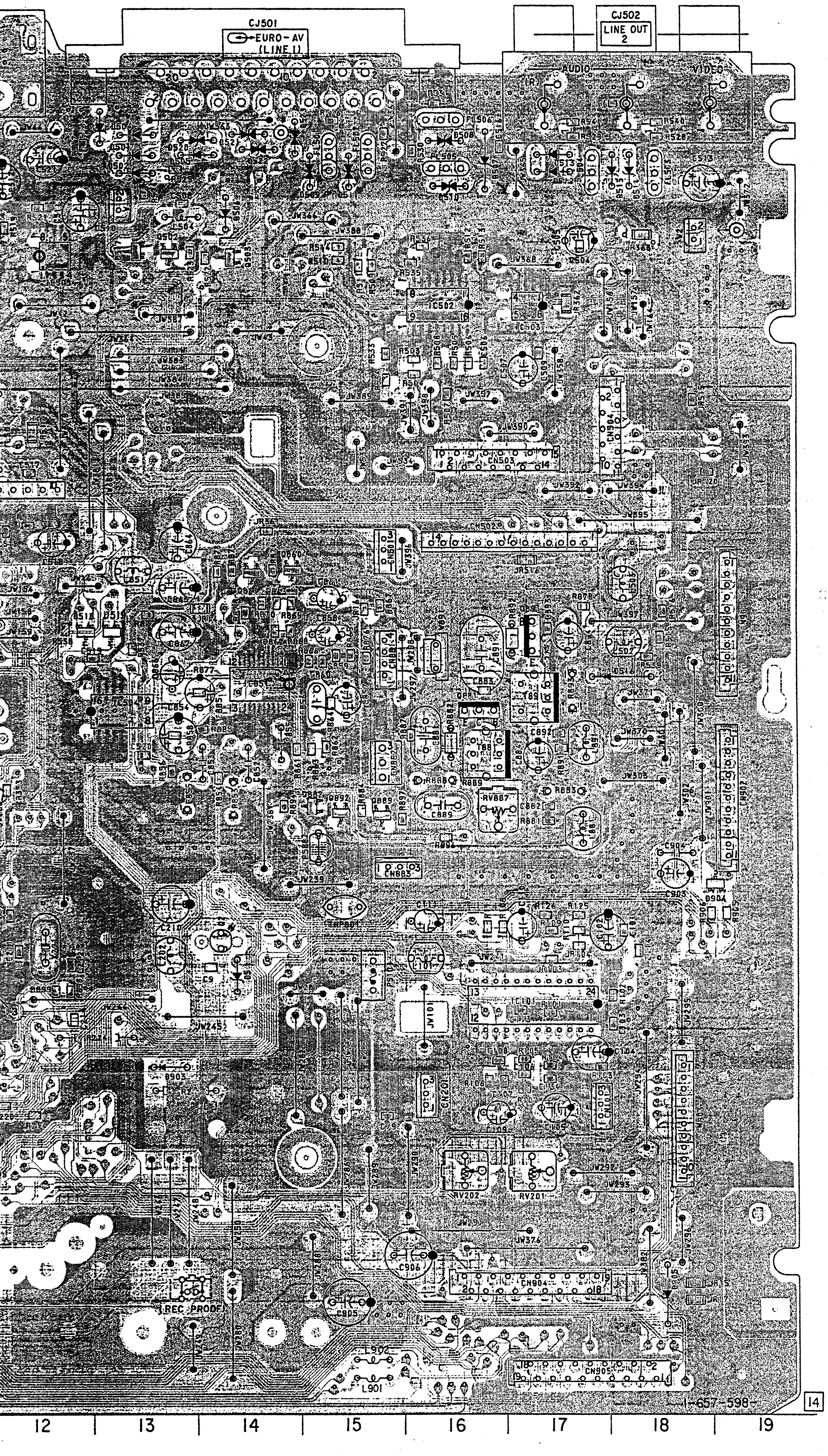
▨ : Pattern of the rear sid

MA-241 BOARD


AERIAL
(OUT) (IN)
RF MODULATOR
TUNER UNIT
CN907
CN908
CN909
CN910
REC PROOF
A
B
C
D
E
F
G
H
I
J
K
L
M
1
2
3
4
5
6
7
8
9
10
11
12
13

ere are few cases that the part isn't mounted in
s model is printed on this diagram.

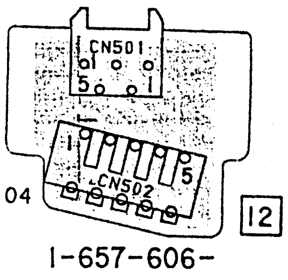
▨ : Pattern of the rear side


CJ501
EURO-AV
(LINE 1)
CJ502
LINE OUT
2
AUDIO
(R)
VIDEO
IC502
IC503
CN503
CN502
CN904
CN883
CN905
RV202
RV201
RV887
REC PROOF
L902
L901
1-657-598-
14
12
13
14
15
16
17
18
19

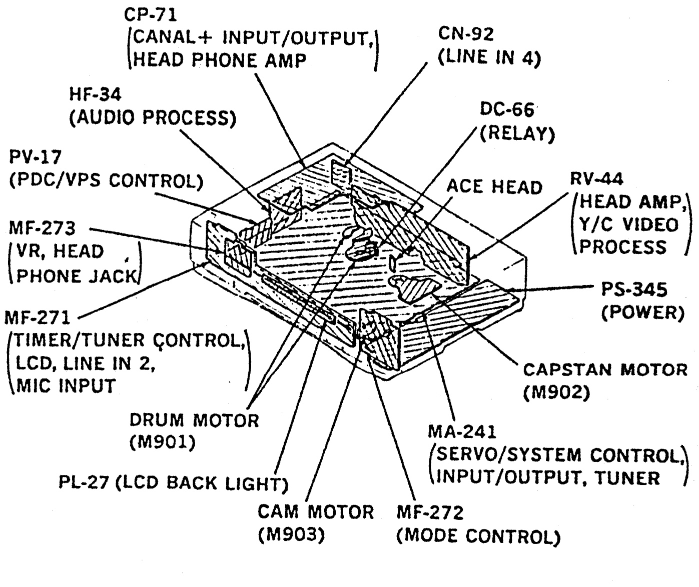
MA-241 BOARD

D1	J-8
D6	M-8
D7	M-5
D71	F-7
D206	K-10
D251	K-9
D252	J-9
D253	K-9
D401	F-5
D402	F-5
D501	B-13
D502	B-13
D503	B-13
D504	B-13
D505	B-13
D506	B-14
D507	B-16
D508	B-16
D509	B-15
D510	B-16
D511	B-15
D512	B-17
D513	B-17
D514	B-18
D515	B-18
D516	G-18
D517	C-13
D518	G-12
D519	G-13
D520	B-14
D521	B-14
D522	B-14
D523	B-15
D702	C-5
D703	B-4
D708	B-10
D709	C-2
D710	C-2
D901	C-9
D902	M-3
D903	K-13
IC2	M-7
IC71	G-8
IC101	J-17
IC201	J-11
IC251	K-9
IC351	I-10
IC401	F-4
IC402	F-6
IC501	E-11
IC502	C-16
IC503	C-17
IC504	G-13
IC505	C-12
IC851	G-14
PH1	M-9
PH2	M-5
Q1	I-1
Q2	J-14
Q3	L-6
Q351	H-10
Q353	H-11
Q354	H-11
Q401	F-5
Q402	G-6
Q404	E-5
Q405	E-5
Q406	G-4
Q407	G-5
Q502	C-13
Q503	C-14
Q702	B-6
Q703	B-4
Q704	B-10
Q706	C-2
Q707	C-2
Q708	C-2
Q709	B-7
Q710	B-11
Q711	B-11
Q712	B-10
Q713	B-10
Q860	F-14
Q861	F-14
Q881	G-16
Q882	H-15
Q889	H-15
Q891	G-17
Q892	H-15

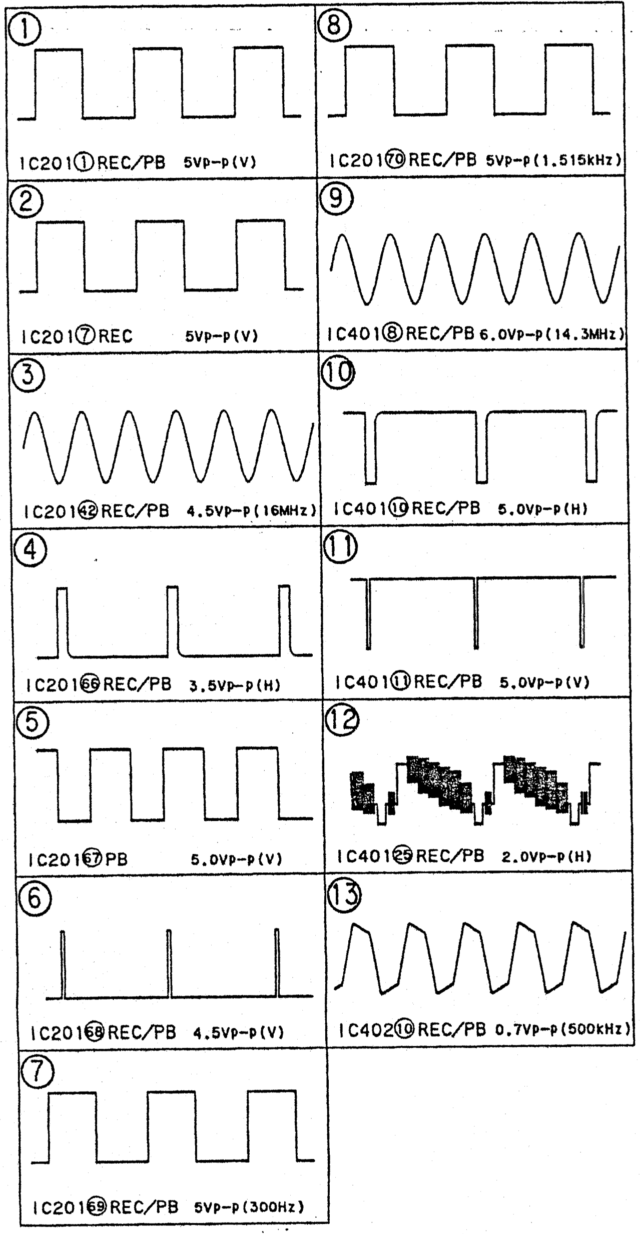
DC-66 BOARD


CN501
1
5
1
CN502
1
5
04
12

1-657-606-

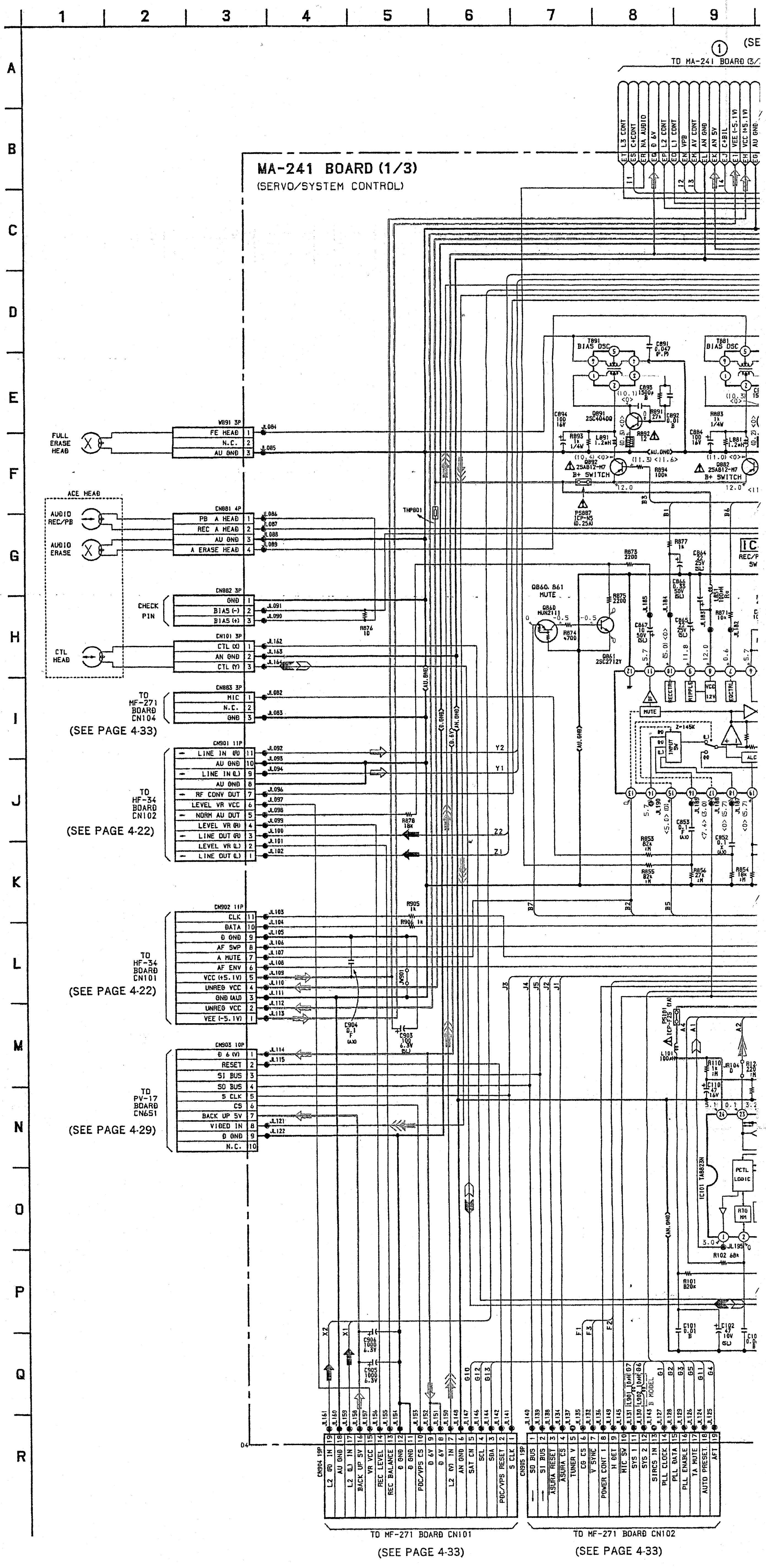

CP-71
(CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
MF-273
(VR, HEAD PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)

MA-241 BOARD

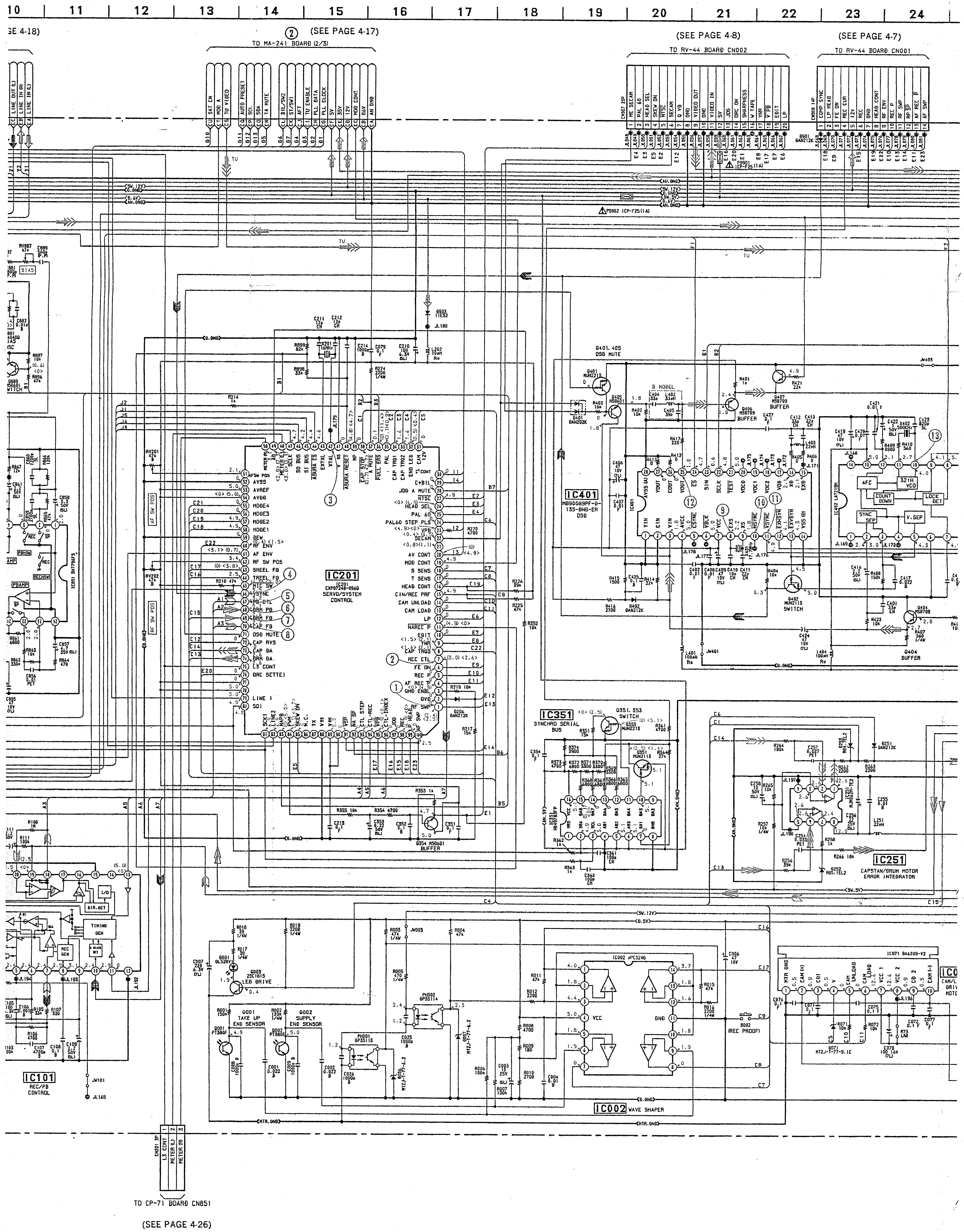


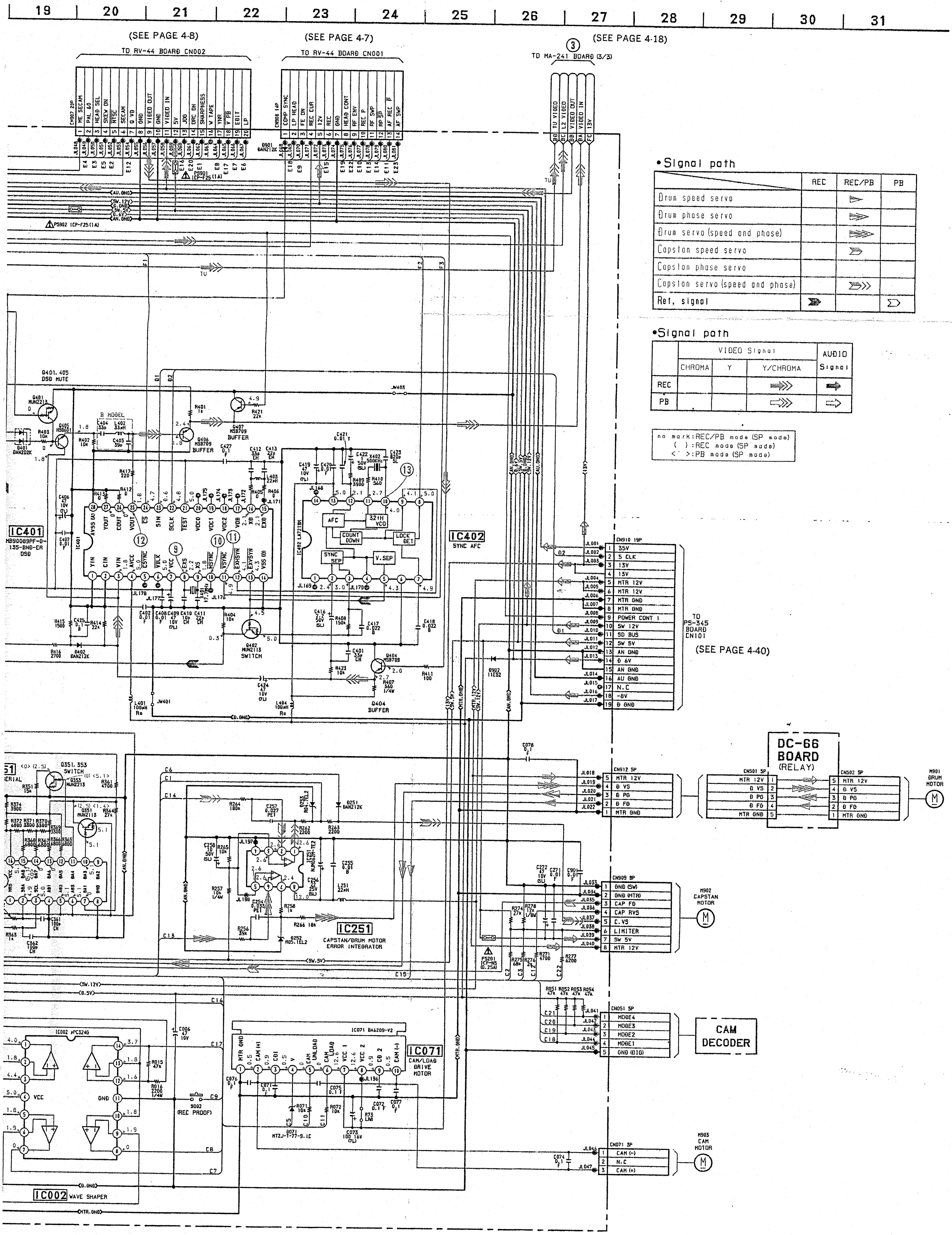
MA-241 (SERVO/SYSTEM CONTROL, NORMAL AUDIO PROCESS) DC-66 (RELAY) SCHEMATIC DIAGRAMS

— Ref. No. MA-241 BOARD : 1,000 series, DC-66 BOARD : 4,000 series —



1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
①
TO MA-241 BOARD (3/
MA-241 BOARD (1/3)
(SERVO/SYSTEM CONTROL)
FULL ERASE HEAD
WB91 3P
FE HEAD
N.C.
AU GND
ACE HEAD
AUDIO REC/PB
AUDIO ERASE
CN881 4P
PB A HEAD
REC A HEAD
AU GND
A ERASE HEAD
CHECK PIN
CN882 3P
GND
BIAS (-)
BIAS (+)
CTL HEAD
CN101 3P
CTL (X)
AN GND
CTL (Y)
TO MF-271 BOARD
(SEE PAGE 4-33)
CN883 3P
MIC
N.C.
GND
TO HF-34 BOARD CN102
(SEE PAGE 4-22)
CN901 11P
LINE IN (R)
AU GND
LINE IN (L)
AU GND
RF CONV OUT
LEVEL VR VCC
NORM AU OUT
LEVEL VR (R)
LINE OUT (R)
LEVEL VR (L)
LINE OUT (L)
TO HF-34 BOARD CN101
(SEE PAGE 4-22)
CN902 11P
CLK
DATA
D GND
AF SWP
A MUTE
AF ENV
VCC (+5.1V)
UNREG VCC
GND (AU)
UNREG VCC
VEE (-5.1V)
TO PV-17 BOARD CN651
(SEE PAGE 4-29)
CN903 10P
D 6 (V)
RESET
SI BUS
SO BUS
S CLK
CS
BACK UP 5V
VIDEO IN
D GND
N.C.
T891 BIAS OSC
T881 BIAS OSC
Q891 2SC4040Q
Q892 2SA812-M7 B+ SWITCH
Q882 2SA812-M7 B+ SWITCH
PS887 ICP-N5 0.25A
THP801
Q860, 861 MUTE
Q860 MUN2111
Q861 2SC2712Y
IC101 TA8823N
PCTL LOGIC
PS101 ICP-F25 (1A)
L101 100µH
CN904 19P
L2 (R) IN
AU GND
L2 (L) IN
BACK UP 5V
VR VCC
REC LEVEL
REC BALANCE
D GND
D GND
PDC/VPS CS
D 6V
D 6V
L2 (V) IN
AN GND
SAT CN
SCL
SDA
PDC/VPS RESET
S CLK
CN905 19P
SO BUS
SI BUS
ASURA RESET
ASURA CS
TUNER V
CG CS
V SYNC
H DET
POWER CONT
RTC SW
SYS 1
SYS 2
SIRCS IN
PLL CLOCK
PLL DATA
PLL ENABLE
TA MUTE
AUTO PRESET
AFT
TO MF-271 BOARD CN101
(SEE PAGE 4-33)
TO MF-271 BOARD CN102
(SEE PAGE 4-33)

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
GE 4-18)
② (SEE PAGE 4-17)
TO MA-241 BOARD (2/3)
(SEE PAGE 4-8)
TO RV-44 BOARD CN002
(SEE PAGE 4-7)
TO RV-44 BOARD CN001
SAT CN
MOD A
TU VIDEO
AUTO PRESET
SCL
SDA
TA MUTE
BIL/SW2
ST/SW1
AFT
TU ENABLE
PLL DATA
PLL CLOCK
5V
12V
MOD CONT
D6V
AN GND
CN907 20P
ME SECAM
PAL 60
HEAD SEL
SKEW ON
NTSC
SECAM
Q VD
GND
VIDEO OUT
GND
VIDEO IN
5V
JOG
ORC ON
SHARPNESS
W TAPE
YNR
Y FB
EDIT
LP
CN908 14P
COMP SYNC
LP HEAD
FE ON
REC CUR
12V
REC
GND
HEAD CONT
REC P
RF ENV
RF SWP
RP SP
AF REC
AF SWP
PS901 ICP-F25(1A)
PS902 ICP-F25(1A)
(SW.12V)
(D.GND)
(D.6V)
(AN.GND)
(AU.GND)
(SW.5V)
TU
D903 11ES2
JL180
X201 16MHz
IC201
CXP87248-096Q
SERVO/SYSTEM CONTROL
Q401, 405 DSD MUTE
Q401 MUN2213
Q405 MSD601
B401 DAN202K
B MODEL
Q406 MSB709 BUFFER
Q407 MSB709 BUFFER
IC401
MB90089PF-G-135-BND-ER
DSD
Q402 MUN2113 SWITCH
IC402 LA7218M
AFC
32fH VCO
COUNT DOWN
LOCK DET
SYNC SEP
V.SEP
Q404 MSB709 BUFFER
IC351
SYNCHRO SERIAL BUS
Q351, 353 SWITCH
Q351 MUN2113
Q353 MUN2213
Q354 MSD601 BUFFER
IC251
CAPSTAN/DRUM MOTOR ERROR INTEGRATOR
IC851 BA7794FS
PBAMP
RECHSW
AF SW POS
RF SW POS
IC101
REC/PB CONTROL
TIMING GEN
REC GEN
DIR.DET
Q001 TAKE UP END SENSOR
Q002 SUPPLY END SENSOR
Q003 2SC1815 LED DRIVE
D001 GL528V1
PH001 GP3S113
PH002 GP3S114
IC002 µPC324G
IC002 WAVE SHAPER
S002 (REC PROOF)
IC071 BA6209-V2
CAM/L DRIVE MOTOR
(MTR.GND)
CN201 3P
L3 CONT
METER (L)
METER (R)
TO CP-71 BOARD CN851
(SEE PAGE 4-26)


19
20
21
22
23
24
25
26
27
28
29
30
31
(SEE PAGE 4-8)
TO RV-44 BOARD CN002
(SEE PAGE 4-7)
TO RV-44 BOARD CN001
③
(SEE PAGE 4-18)
TO MA-241 BOARD (3/3)
CN902 20P
ME SECAM
PAL 60
HEAD SEL
SKEW ON
NTSC
SECAM
Q VB
GND
VIDEO OUT
GND
VIDEO IN
5V
JOG
DRC ON
SHARPNESS
V TAPE
YNR
Y PB
EDIT
LP
CN908 14P
COMP SYNC
LP HEAD
FE ON
REC CUR
12V
REC
GND
HEAD CONT
RF ENV
REC P
RF SWP
PB SP
AF REC P
AF SWP
TU VIDEO
L2 VIDEO
VIDEO OUT
VIDEO IN
13V
PS902 ICP-F25 (1A)
PS901 ICP-F25 (1A)
Q401, 405 DSD MUTE
Q407 MSB709 BUFFER
Q406 MSB709 BUFFER
B MODEL
IC401
MB90089PF-G-135-BND-ER DSD
IC402
SYNC AFC
IC402 LA7218M
AFC
321H VCO
COUNT DOWN
LOCK DET
SYNC SEP
V.SEP
Q402 MUN2113 SWITCH
Q404 MSB709 BUFFER
D902 11ES2
CN910 19P
35V
S CLK
13V
13V
MTR 12V
MTR 12V
MTR GND
MTR GND
POWER CONT 1
SW 12V
SD BUS
SW 5V
AN GND
D 6V
AN GND
AU GND
N.C
-8V
D GND
TO PS-345 BOARD CN101
(SEE PAGE 4-40)
Q351, 353 SWITCH
CN912 5P
MTR 12V
D VS
D PG
D FG
MTR GND
DC-66 BOARD (RELAY)
CN501 5P
CN502 5P
M901 DRUM MOTOR
IC251
CAPSTAN/DRUM MOTOR ERROR INTEGRATOR
CN909 8P
GND (SW)
GND (MTR)
CAP FG
CAP RVS
C.VS
LIMITER
SW 5V
MTR 12V
M902 CAPSTAN MOTOR
PS201 ICP-N5 (0.25A)
CN051 5P
MODE4
MODE3
MODE2
MODE1
GND (DIG)
CAM DECODER
IC002 μPC324G
IC002 WAVE SHAPER
S002 (REC PROOF)
IC071 BA6209-V2
IC071 CAM/LOAD DRIVE MOTOR
CN071 3P
CAM (-)
N.C
CAM (+)
M903 CAM MOTOR

•Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		⇒	
Drum servo (speed and phase)		⇒	
Capstan speed servo		⇒	
Capstan phase servo			
Capstan servo (speed and phase)		⇒»	
Ref. signal	➡		▷

•Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			⇛	➡
PB			⇨	⇨

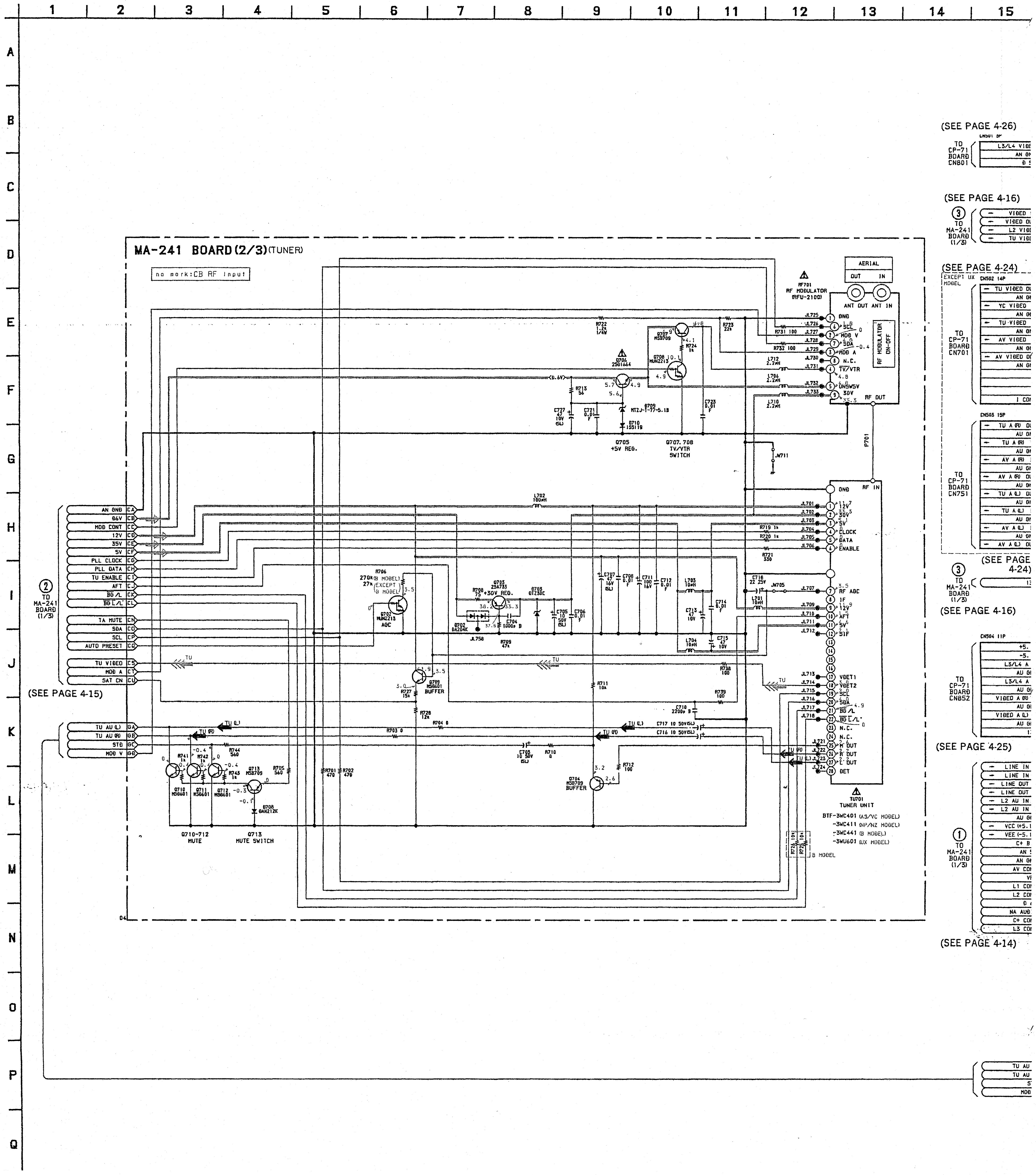
no mark:REC/PB mode (SP mode)
( ):REC mode (SP mode)
< >:PB mode (SP mode)

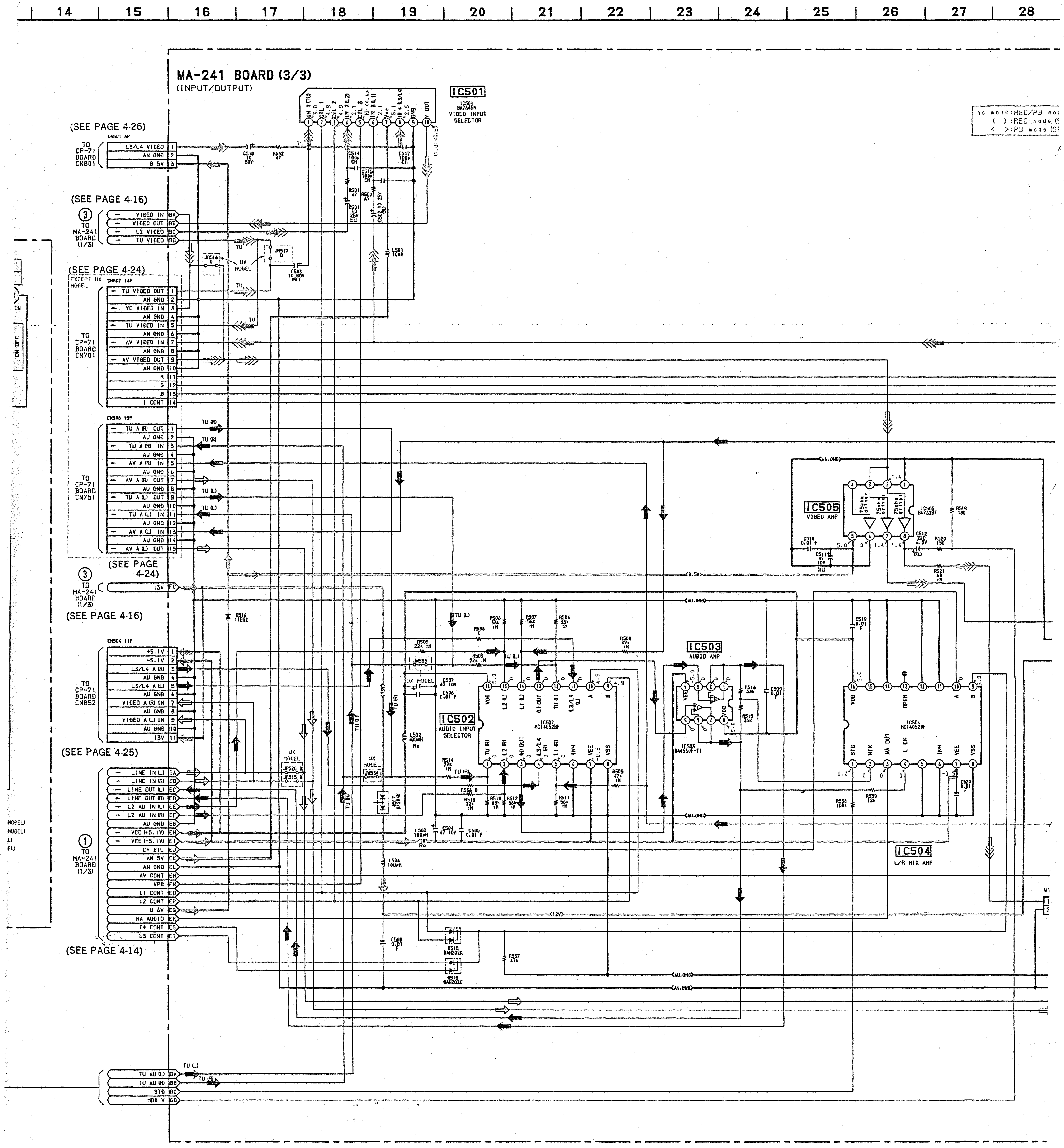
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

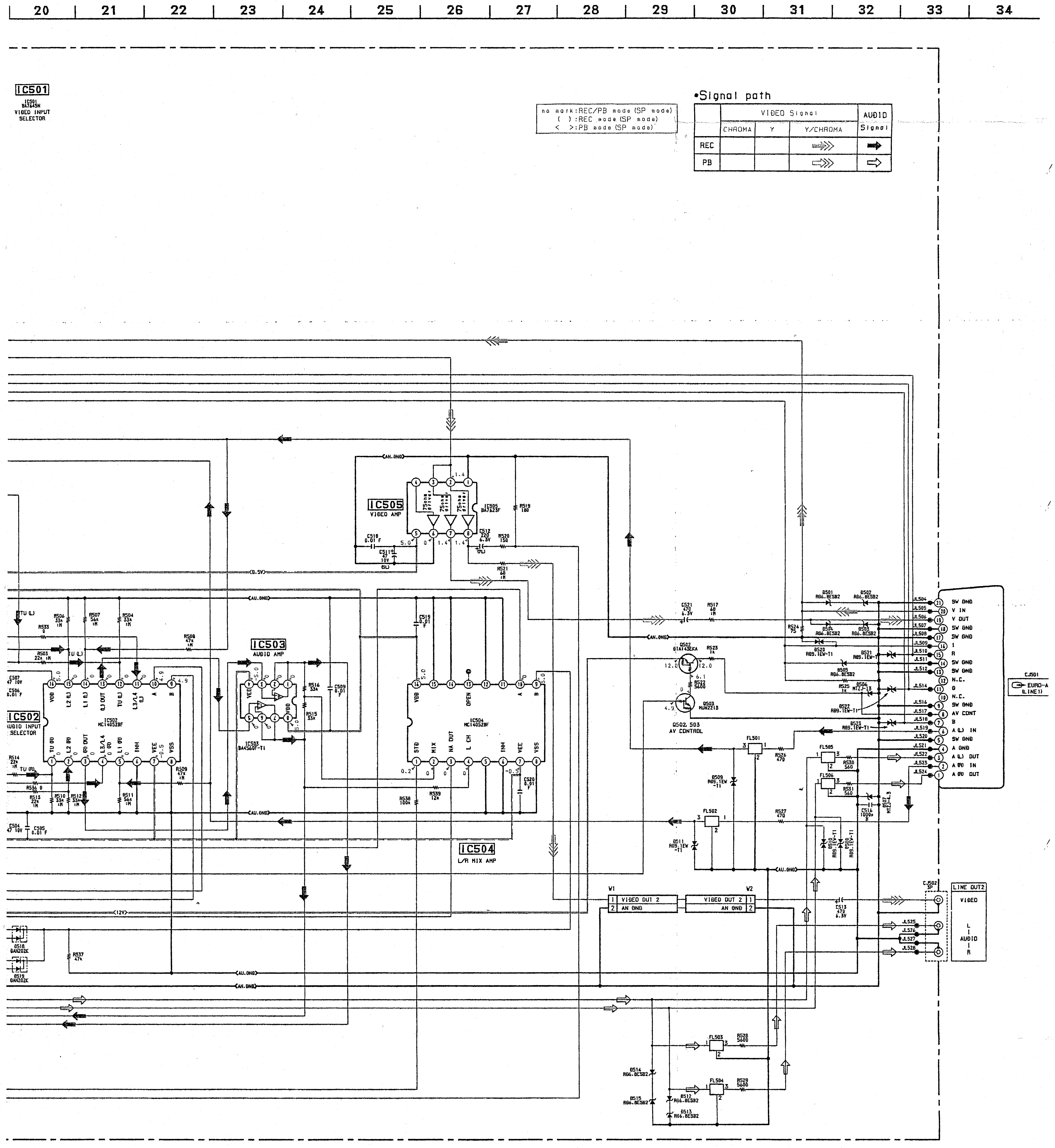
MA-241 (INPUT/OUTPUT, TUNER) SCHEMATIC DIAGRAM

— Ref. No. MA-241 BOARD : 1,000 series —

- **Refer to page 4-10 for printed wiring board.**


MA-241 BOARD (2/3) (TUNER)
no mark : CB RF input
AERIAL
OUT IN
ANT OUT ANT IN
RF701
RF MODULATOR
(RFU-2100)
RF MODULATOR ON-OFF
RF OUT
RF IN
GND
SCL
MOD V
SDA
MOD A
N.C.
TV/VTR
UNSW5V
30V
Q705
+5V REG.
Q707, 708
TV/VTR SWITCH
Q706
2SD1664
Q707
MSB709
Q708
MUN2213
D709
MTZJ-T-77-5.1B
D710
1SS119
L702
100μH
Q703
2SA733
+30V REG.
D703
DTZ30C
D702
DA204K
Q702
MUN2213
AGC
Q709
MSB601
BUFFER
Q704
MSB709
BUFFER
Q710-712
MUTE
Q713
MUTE SWITCH
D708
DAN212K
Q710
MSB601
Q711
MSB601
Q712
MSB601
Q713
MSB709
TU701
TUNER UNIT
BTF-3WC401 (AS/VC MODEL)
-3WC411 (NP/NZ MODEL)
-3WC441 (B MODEL)
-3WU601 (UX MODEL)
B MODEL
12V
30V
5V
CLOCK
DATA
ENABLE
RF AGC
IF
AFT
SIF
VDET1
VDET2
BG L/L'
R OUT
L OUT
DET
AN GND
B6V
MOD CONT
12V
35V
5V
PLL CLOCK
PLL DATA
TU ENABLE
AFT
BG/L
BG L/L'
TA MUTE
SDA
SCL
AUTO PRESET
TU VIDEO
MOD A
SAT CN
TU AU (L)
TU AU (R)
STG
MOD V
② TO MA-241 BOARD (1/3)
(SEE PAGE 4-15)
(SEE PAGE 4-26)
TO CP-71 BOARD CN801
(SEE PAGE 4-16)
③ TO MA-241 BOARD (1/3)
(SEE PAGE 4-24)
EXCEPT UX MODEL
TO CP-71 BOARD CN701
TO CP-71 BOARD CN751
(SEE PAGE 4-24)
③ TO MA-241 BOARD (1/3)
(SEE PAGE 4-16)
TO CP-71 BOARD CN852
(SEE PAGE 4-25)
① TO MA-241 BOARD (1/3)
(SEE PAGE 4-14)


14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
MA-241 BOARD (3/3)
(INPUT/OUTPUT)
IC501
IC501 BA7645N VIDEO INPUT SELECTOR
no mark:REC/PB mo
( ):REC mode
< >:PB mode
(SEE PAGE 4-26)
TO CP-71 BOARD CN801
L3/L4 VIDEO
AN GND
B 5V
(SEE PAGE 4-16)
TO MA-241 BOARD (1/3)
VIDEO IN
VIDEO OUT
L2 VIDEO
TU VIDEO
JR516
JR517
UX MODEL
(SEE PAGE 4-24)
EXCEPT UX MODEL
CN502 14P
TO CP-71 BOARD CN701
TU VIDEO OUT
AN GND
YC VIDEO IN
TU VIDEO IN
AV VIDEO IN
AV VIDEO OUT
R
G
B
I CONT
CN503 15P
TO CP-71 BOARD CN751
TU A (R) OUT
AU GND
TU A (R) IN
AV A (R) IN
AV A (R) OUT
TU A (L) OUT
TU A (L) IN
AV A (L) IN
AV A (L) OUT
(SEE PAGE 4-24)
TO MA-241 BOARD (1/3)
13V
(SEE PAGE 4-16)
CN504 11P
TO CP-71 BOARD CN852
+5.1V
-5.1V
L3/L4 A (R)
L3/L4 A (L)
VIDEO A (R) IN
VIDEO A (L) IN
(SEE PAGE 4-25)
TO MA-241 BOARD (1/3)
LINE IN (L)
LINE IN (R)
LINE OUT (L)
LINE OUT (R)
L2 AU IN (L)
L2 AU IN (R)
AU GND
VCC (+5.1V)
VEE (-5.1V)
C+ BIL
AN 5V
AN GND
AV CONT
VPB
L1 CONT
L2 CONT
B 6V
NA AUDIO
C+ CONT
L3 CONT
(SEE PAGE 4-14)
TU AU (L)
TU AU (R)
STD
MOD V
IC505
VIDEO AMP
IC505 BA7623F
75ohm driver
IC502
AUDIO INPUT SELECTOR
IC502 MC14052BF
IC503
AUDIO AMP
IC503 BA4560F-T1
IC504
L/R MIX AMP
IC504 MC14052BF
(AN.GND)
(AU.GND)
(B.5V)
(12V)
D518 DAN202K
D519 DAN202K
D516 1ES2
L501 10uH
L502 100uH
L503 100uH
L504 100uH


20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
IC501
IC501 BA7645N VIDEO INPUT SELECTOR
IC502
AUDIO INPUT SELECTOR
IC502 MC14052BF
VDD
L2 (L)
L1 (L)
(L) OUT
TU (L)
L3/L4 (L)
A
B
TU (R)
L2 (R)
(R) OUT
L3/L4 (R)
L1 (R)
INH
VEE
VSS
R503 22k
R504 33k
R506 33k
R507 56k
R508 47k
R509 47k
R510 33k
R511 56k
R512 33k
R513 22k
R514 22k
R533 0
R536 0
C504 47 10V
C505 0.01 F
C506 0.01 F
C507 47 10V
IC503
AUDIO AMP
IC503 BA4560F-T1
R515 33k
R516 33k
C509 0.01 F
IC505
VIDEO AMP
IC505 BA7623F
75ohm driver
C510 0.01 F
C511 47 10V
C512 220 6.3V
R519 180
R520 150
R521 68
IC504
L/R MIX AMP
IC504 MC14052BF
STD
MIX
NA OUT
L CH
OPEN
C519 0.01 F
C520 0.01 F
R538 100k
R539 12k
<D.5V>
<AU.GND>
<AN.GND>
<12V>
C521 470 6.3V
R517 68
Q502 DTA143EKA
R523 1k
R522 5600
Q503 MUN2213
Q502, 503 AV CONTROL
D501 RD6.8ESB2
D502 RD6.8ESB2
D503 RD6.8ESB2
D504 RD6.8ESB2
D505 RD6.8ESB2
D506 MTZJ-13
D507 MTZJ-4.3
D508 RD9.1EW-T1
D509 RD9.1EW-T1
D510 RD9.1EW-T1
D511 RD9.1EW-T1
D520 RD9.1EW-T1
D521 RD9.1EW-T1
D522 RD9.1EW-T1
D523 RD9.1EW-T1
R524 75
R525 1k
R526 470
R527 470
R530 560
R531 560
C516 1000p B
FL501
FL502
FL505
FL506
JL504
JL505
JL506
JL507
JL508
JL509
JL510
JL511
JL512
JL514
JL516
JL517
JL518
JL519
JL520
JL521
JL522
JL523
JL524
21 SW GND
20 V IN
19 V OUT
18 SW GND
17 SW GND
16 I
15 R
14 SW GND
13 SW GND
12 N.C.
11 G
10 N.C.
9 SW GND
8 AV CONT
7 B
6 A (L) IN
5 SW GND
4 A GND
3 A (L) OUT
2 A (R) IN
1 A (R) OUT
CJ501
EURO-A (LINE1)
W1
1 VIDEO OUT 2
2 AN GND
W2
VIDEO OUT 2 1
AN GND 2
C513 470 6.3V
CJ502 SP
JL525
JL526
JL527
JL528
LINE OUT2
VIDEO
L
AUDIO
R
D516 BAN202K
D519 BAN202K
R537 47k
FL503
FL504
R528 5600
R529 5600
D512 RD6.8ESB2
D513 RD6.8ESB2
D514 RD6.8ESB2
D515 RD6.8ESB2

no mark:REC/PB mode (SP mode)
( ):REC mode (SP mode)
< >:PB mode (SP mode)

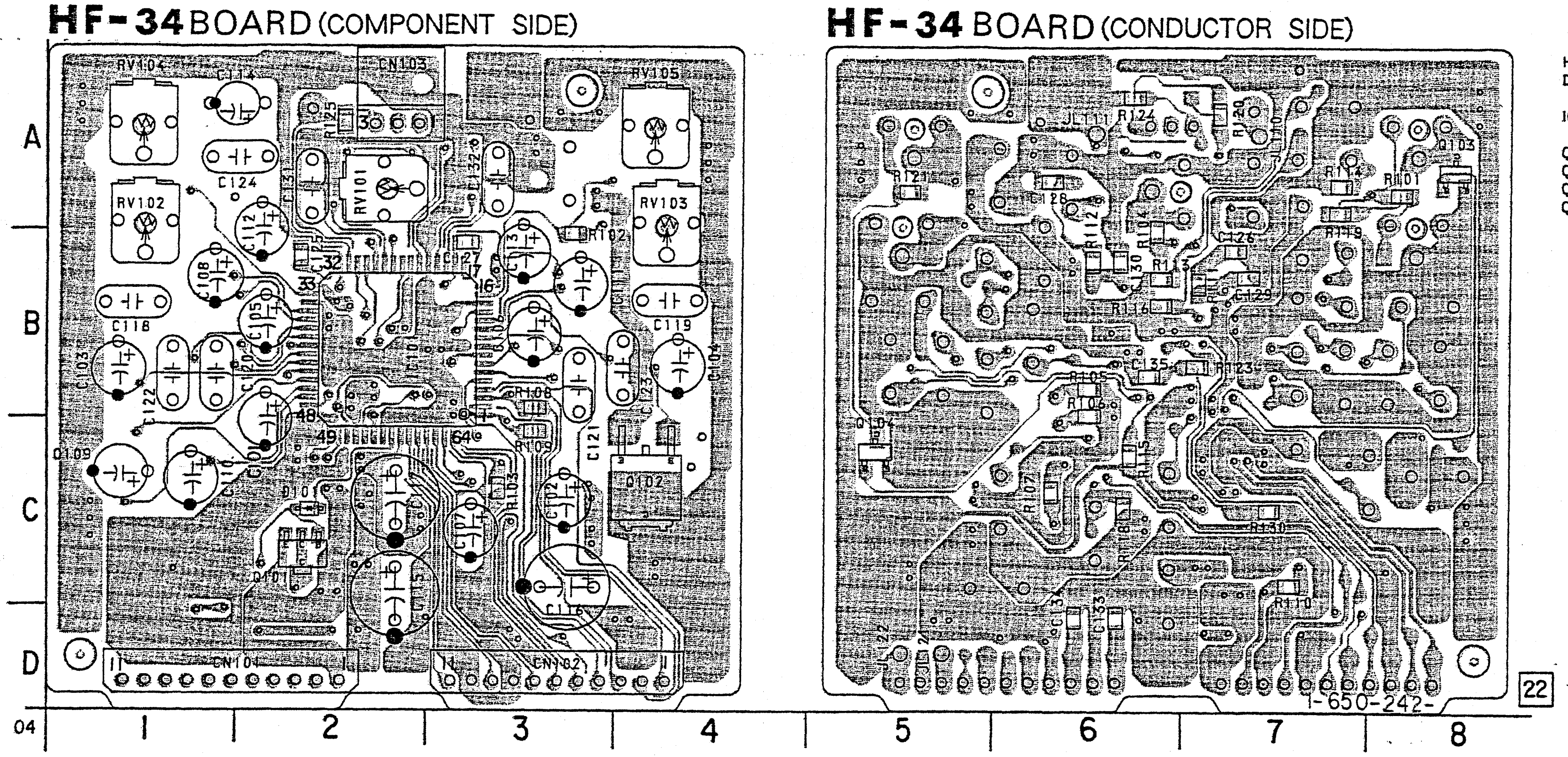
•Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			➡›››	➡
PB			⇨›››	⇨

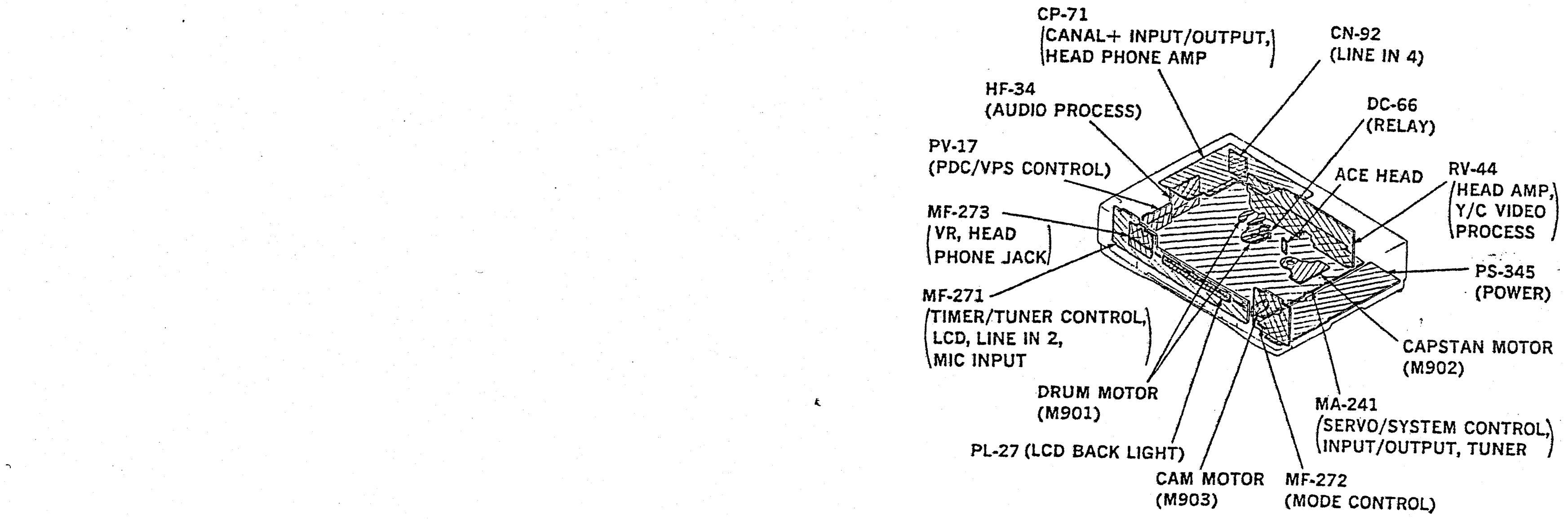
HF-34 (AUDIO PROCESS) PRINTED WIRING BOARD

— Ref. No. HF-34 BOARD : 4,000 series —

- There are few cases that the part isn't mounted in this model is printed on this diagram.

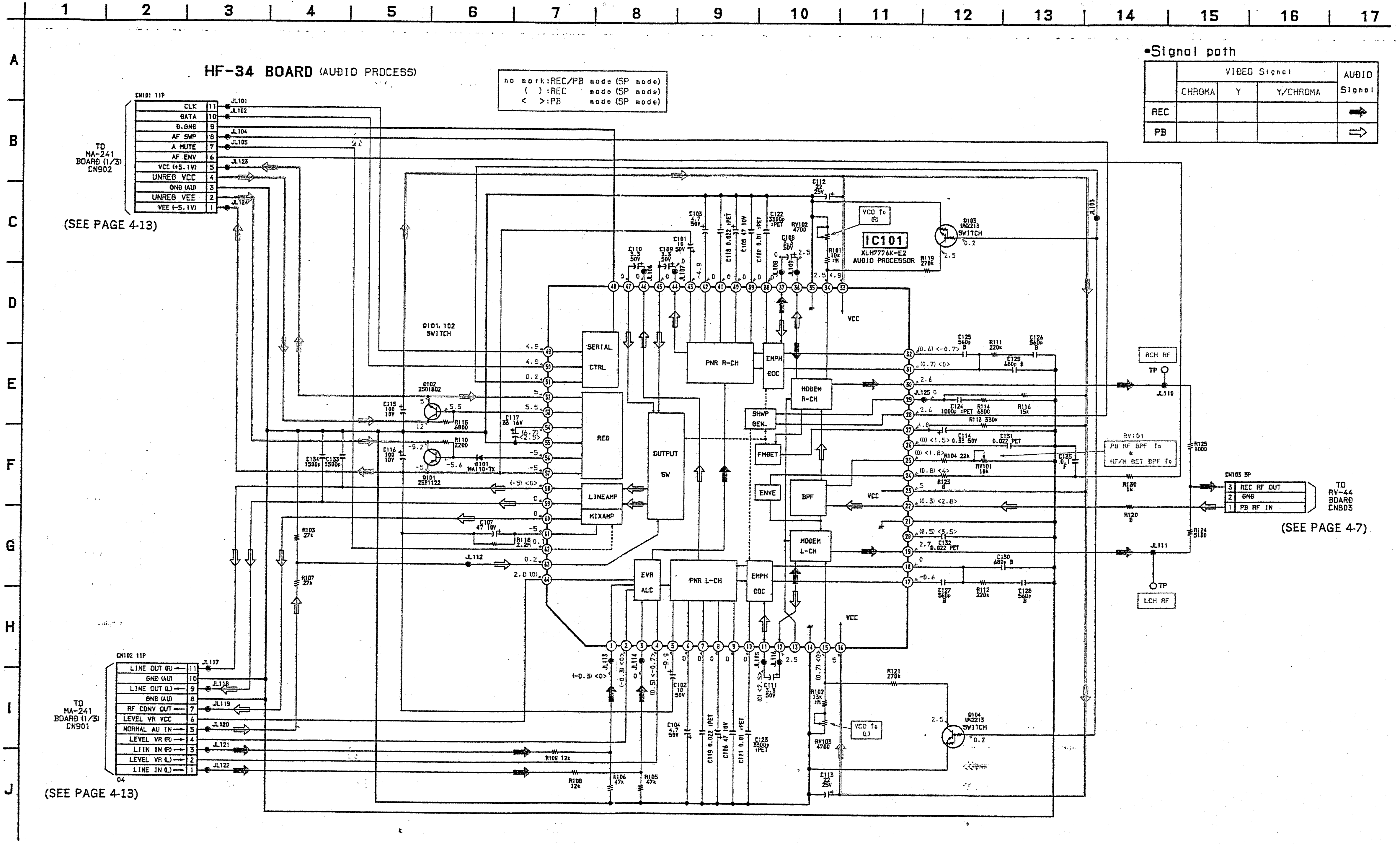

HF-34 BOARD (COMPONENT SIDE)
HF-34 BOARD (CONDUCTOR SIDE)
A
B
C
D
04
1
2
3
4
5
6
7
8
RV104
RV105
RV102
RV103
RV101
CN103
CN104
CN102
C114
C124
C118
C119
C121
D101
Q101
Q102
Q103
22
1-650-242-

HF-34 BOARD	
D101	C-2
IC101	B-2
Q101	C-2
Q102	C-4
Q103	A-8
Q104	C-5


CP-71
(CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
MF-273
(VR, HEAD PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)

HF-34 (AUDIO PROCESS) SCHEMATIC DIAGRAM

— Ref. No. HF-34 BOARD : 4,000 series —

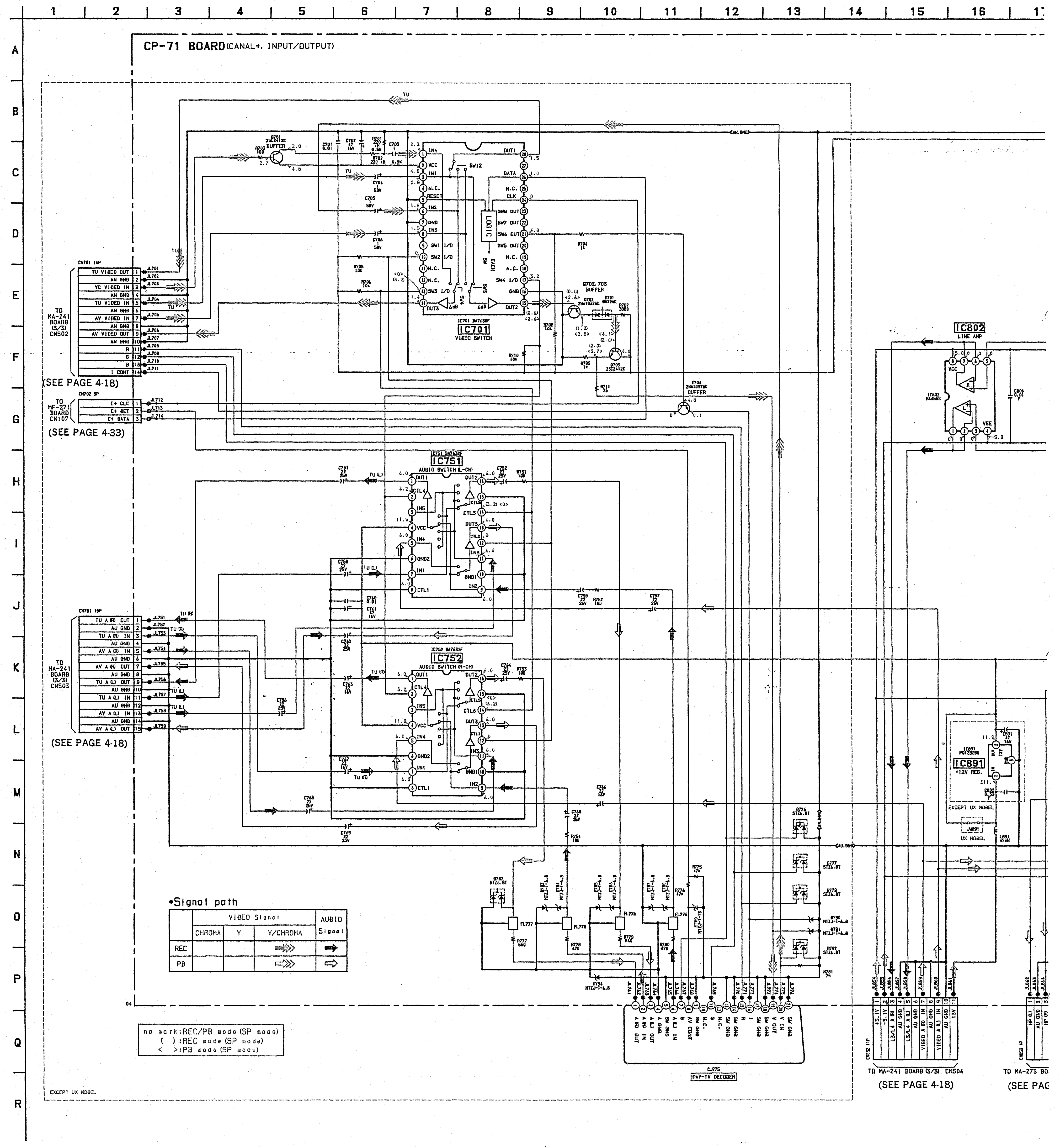

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
A
B
C
D
E
F
G
H
I
J
HF-34 BOARD (AUDIO PROCESS)
no mark:REC/PB mode (SP mode)
( ):REC mode (SP mode)
< >:PB mode (SP mode)
CN101 11P
CLK 11
DATA 10
D.GND 9
AF SWP 8
A MUTE 7
AF ENV 6
VCC (+5.1V) 5
UNREG VCC 4
GND (AU) 3
UNREG VEE 2
VEE (-5.1V) 1
JL101
JL102
JL104
JL105
JL123
JL124
TO MA-241 BOARD (1/3) CN902
(SEE PAGE 4-13)
IC101
XLH7776K-E2
AUDIO PROCESSOR
VCO fo (R)
VCO fo (L)
Q103 UN2213 SWITCH
Q104 UN2213 SWITCH
Q101, 102 SWITCH
Q102 2SD1802
Q101 2SB1122
D101 MA110-TX
SERIAL CTRL
REG
OUTPUT SW
LINEAMP
MIXAMP
PNR R-CH
PNR L-CH
EMPH DOC
MODEM R-CH
MODEM L-CH
SHWP GEN.
FMDET
ENVE
BPF
EVR ALC
VCC
RV101
PB RF BPF fo & HF/N DET BPF fo
RV102 4700
RV103 4700
RCH RF
LCH RF
TP
JL110
JL111
JL112
R125 1000
R124 5100
R130 1k
R120 0
CN103 3P
3 REC RF OUT
2 GND
1 PB RF IN
TO RV-44 BOARD CN803
(SEE PAGE 4-7)
CN102 11P
LINE OUT (R) 11
GND (AU) 10
LINE OUT (L) 9
GND (AU) 8
RF CONV OUT 7
LEVEL VR VCC 6
NORMAL AU IN 5
LEVEL VR (R) 4
LIIN IN (R) 3
LEVEL VR (L) 2
LINE IN (L) 1
04
JL117
JL118
JL119
JL120
JL121
JL122
TO MA-241 BOARD (1/3) CN901
(SEE PAGE 4-13)

•Signal path

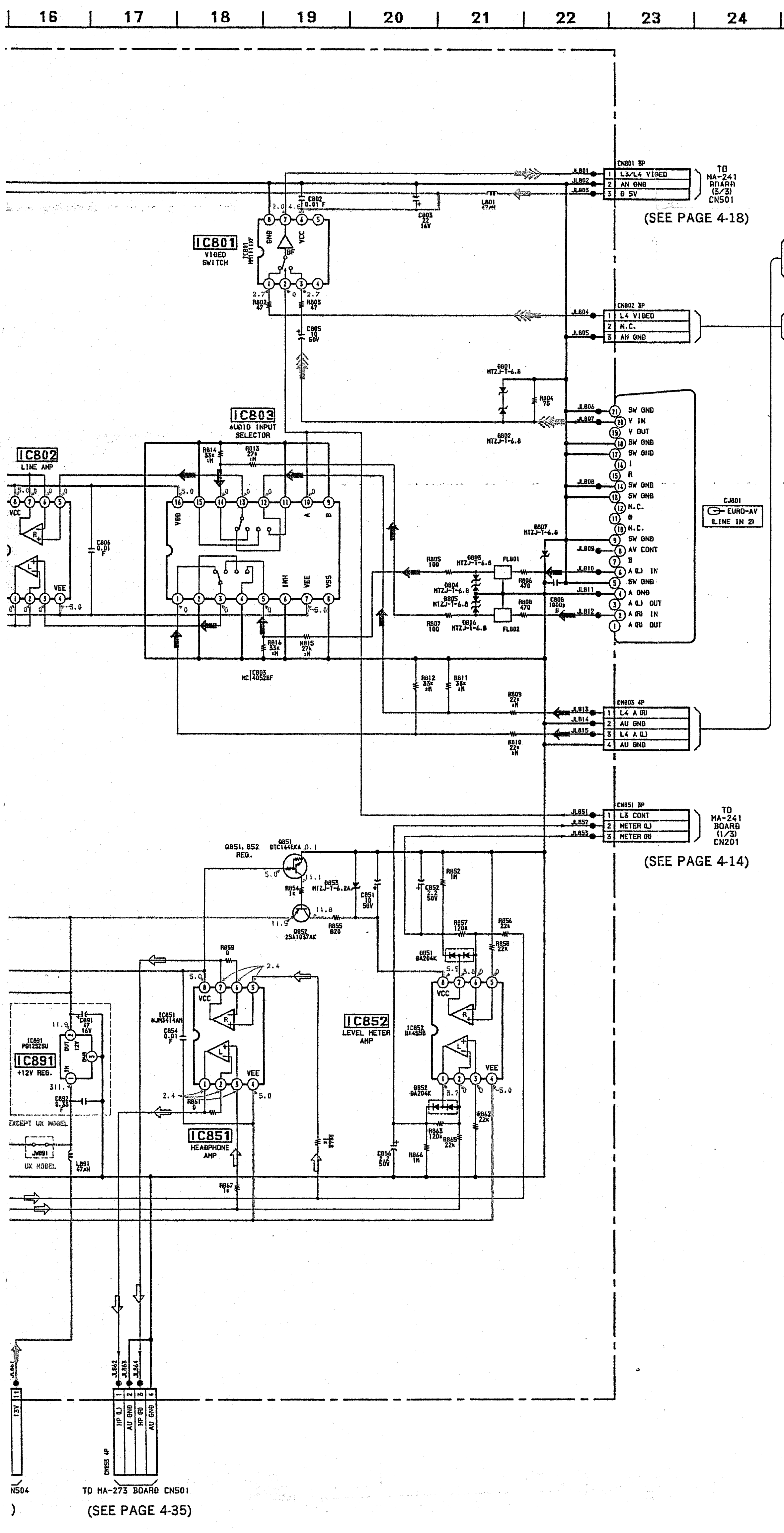
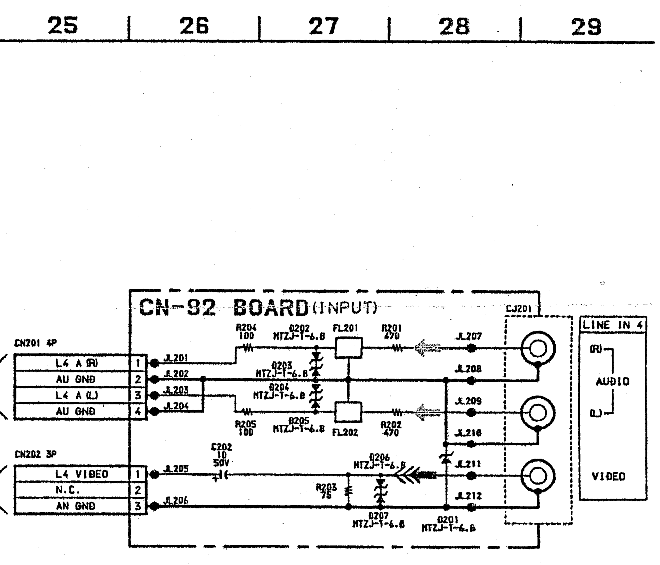
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

CP-71 (CANAL+ INPUT/OUTPUT, HEADPHONE AMP) CN-92 (LINE IN 4) SCHEMATIC DIAGRAMS

— Ref. No. CP-71 BOARD, CN-92 BOARD : 5,000 series —

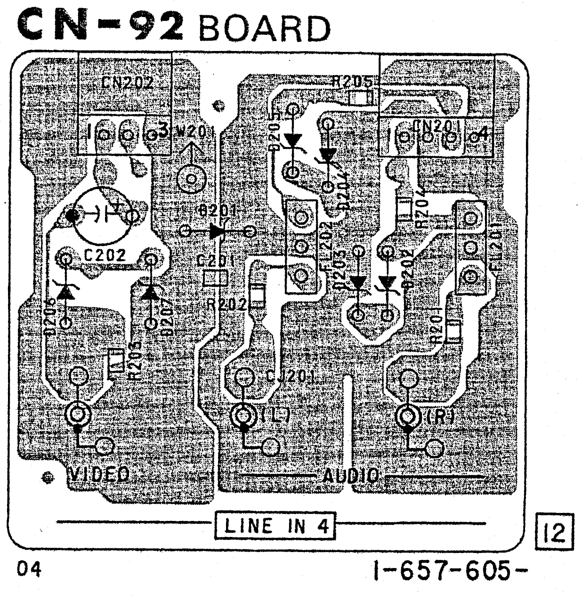


CP-71 BOARD (CANAL+, INPUT/OUTPUT)
IC701 BA7630F
IC701
VIDEO SWITCH
LOGIC
Q701 2SC2412K BUFFER
Q702, 703 BUFFER
Q704 2SA1037AK BUFFER
IC751 BA7632F
IC751
AUDIO SWITCH (L-CH)
IC752 BA7632F
IC752
AUDIO SWITCH (R-CH)
IC802
LINE AMP
IC802 BA4558
IC891
+12V REG.
EXCEPT UX MODEL
UX MODEL
CN701 14P
TU VIDEO OUT
AN GND
YC VIDEO IN
AN GND
TU VIDEO IN
AN GND
AV VIDEO IN
AN GND
AV VIDEO OUT
AN GND
R
G
B
I CONT
TO MA-241 BOARD (3/3) CN502
(SEE PAGE 4-18)
CN702 3P
C+ CLK
C+ RST
C+ DATA
TO MF-271 BOARD CN107
(SEE PAGE 4-33)
CN751 15P
TU A (R) OUT
AU GND
TU A (R) IN
AU GND
AV A (R) IN
AU GND
AV A (R) OUT
AU GND
TU A (L) OUT
AU GND
TU A (L) IN
AU GND
AV A (L) IN
AU GND
AV A (L) OUT
TO MA-241 BOARD (3/3) CN503
(SEE PAGE 4-18)
•Signal path
VIDEO Signal
AUDIO Signal
CHROMA
Y
Y/CHROMA
REC
PB
no mark:REC/PB mode (SP mode)
( ) :REC mode (SP mode)
< >:PB mode (SP mode)
CJ775
PAY-TV DECODER
CN852 11P
TO MA-241 BOARD (3/3) CN504
(SEE PAGE 4-18)
TO MA-273 BO
(SEE PAG
EXCEPT UX MODEL

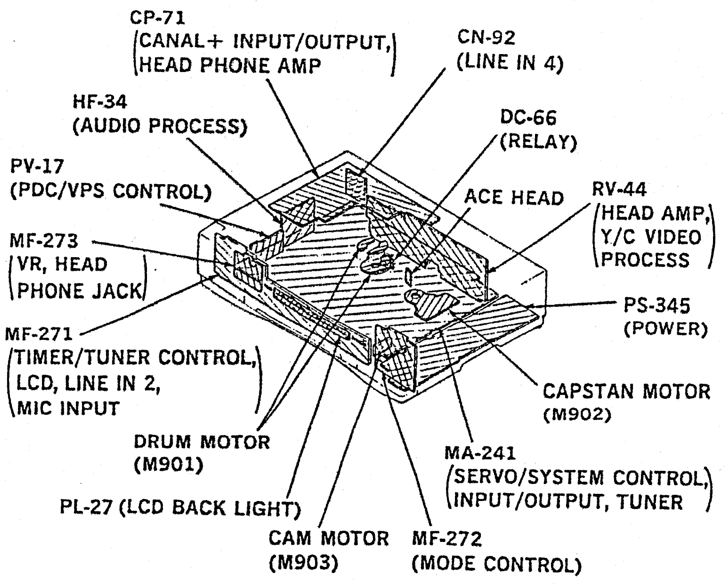


16
17
18
19
20
21
22
23
24
25
26
27
28
29
IC801
VIDEO SWITCH
IC803
AUDIO INPUT SELECTOR
IC802
LINE AMP
IC803
MC14052BF
CN801 3P
L3/L4 VIDEO
AN GND
B 5V
TO MA-241 BOARD (3/3) CN501
(SEE PAGE 4-18)
CN802 3P
L4 VIDEO
N.C.
AN GND
CJ801
EURO-AV (LINE IN 2)
SW GND
V IN
V OUT
SW GND
SW GND
R
SW GND
SW GND
N.C.
N.C.
SW GND
AV CONT
B
A (L) IN
SW GND
A GND
A (L) OUT
A (R) IN
A (R) OUT
CN803 4P
L4 A (R)
AU GND
L4 A (L)
AU GND
CN851 3P
L3 CONT
METER (L)
METER (R)
TO MA-241 BOARD (1/3) CN201
(SEE PAGE 4-14)
CN-92 BOARD (INPUT)
CN201 4P
L4 A (R)
AU GND
L4 A (L)
AU GND
CN202 3P
L4 VIDEO
N.C.
AN GND
CJ201
LINE IN 4
(R)
AUDIO
(L)
VIDEO
Q851, 852 REG.
IC852
LEVEL METER AMP
IC851
HEADPHONE AMP
IC891
+12V REG.
EXCEPT UK MODEL
UK MODEL
CN853 4P
HP (L)
AU GND
HP (R)
AU GND
TO MA-273 BOARD CN501
(SEE PAGE 4-35)
N504

CN-92 (LINE IN 4) PRINTED WIRING BOARD

— Ref. No. CN-92 BOARD : 5,000 series —


CN-92 BOARD
CN202
CN201
R205
C202
C201
R201
R202
R203
R204
FL201
FL202
CJ201
VIDEO
AUDIO
(L)
(R)
LINE IN 4
12
04
1-657-605-

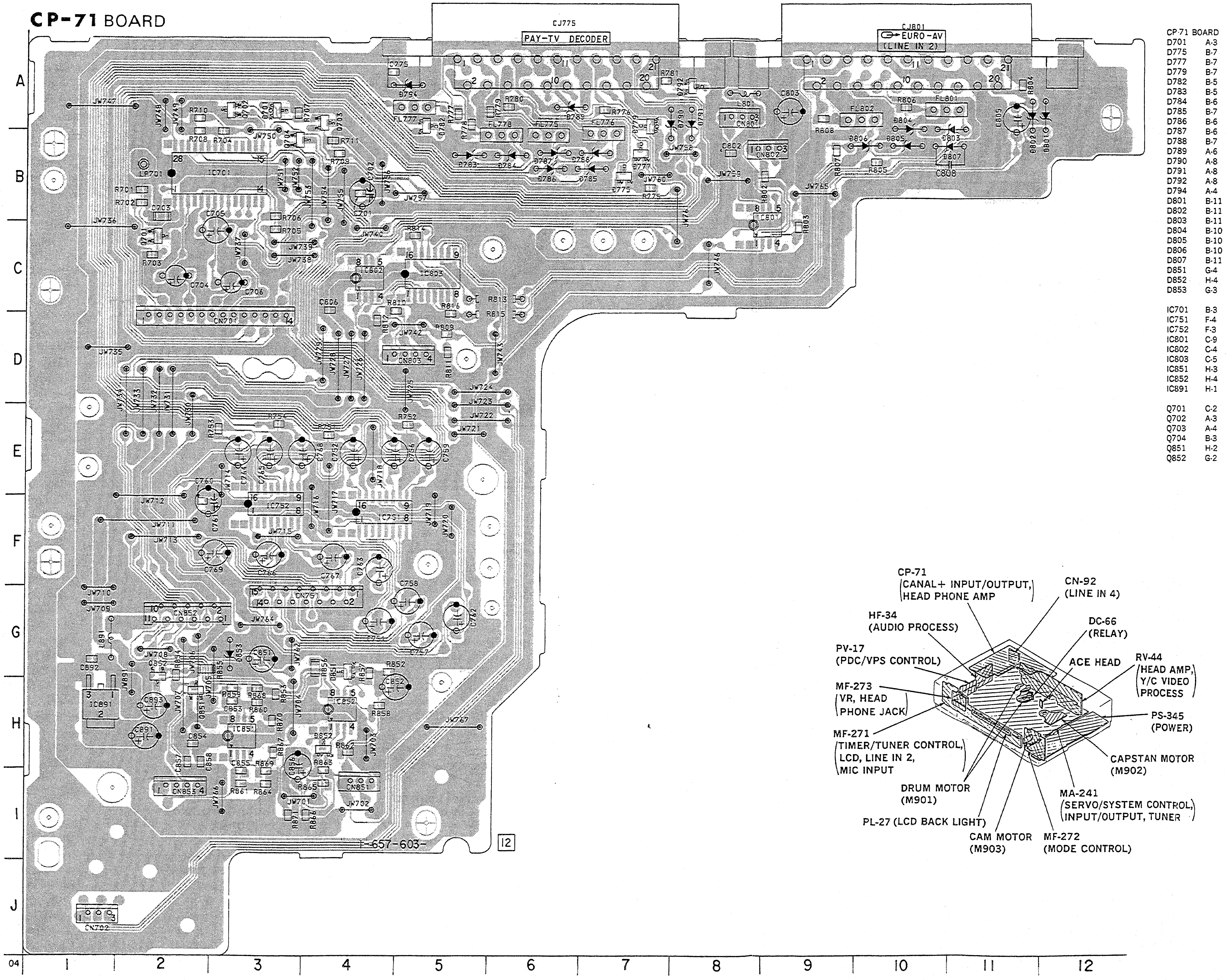
- There are few cases that the part isn't mounted in this model is printed on this diagram.


CP-71 (CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92 (LINE IN 4)
HF-34 (AUDIO PROCESS)
DC-66 (RELAY)
PV-17 (PDC/VPS CONTROL)
ACE HEAD
RV-44 (HEAD AMP, Y/C VIDEO PROCESS)
MF-273 (VR, HEAD PHONE JACK)
PS-345 (POWER)
MF-271 (TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR (M902)
DRUM MOTOR (M901)
MA-241 (SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR (M903)
MF-272 (MODE CONTROL)

CP-71 (CANAL+ INPUT/OUTPUT, HEADPHONE AMP) PRINTED WIRING BOARD

— Ref. No. CP-71 BOARD : 5,000 series —

• There are few cases that the part isn't mounted in this model is printed on this diagram.

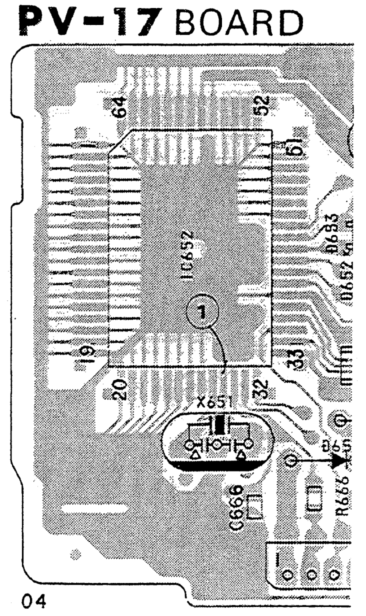

CP-71 BOARD
CJ775
PAY-TV DECODER
CJ801
EURO-AV (LINE IN 2)
IC701
IC751
IC752
IC802
IC803
IC851
IC852
IC891
CN701
CN702
CN751
CN801
CN802
CN803
CN851
CN852
CN853
LP701
FL775
FL776
FL777
FL778
FL801
FL802
L801
F-657-603-
12
A
B
C
D
E
F
G
H
I
J
04
1
2
3
4
5
6
7
8
9
10
11
12

CP-71 BOARD	
D701	A-3
D775	B-7
D777	B-7
D779	B-7
D782	B-5
D783	B-5
D784	B-6
D785	B-7
D786	B-6
D787	B-6
D788	B-7
D789	A-6
D790	A-8
D791	A-8
D792	A-8
D794	A-4
D801	B-11
D802	B-11
D803	B-11
D804	B-10
D805	B-10
D806	B-10
D807	B-11
D851	G-4
D852	H-4
D853	G-3
IC701	B-3
IC751	F-4
IC752	F-3
IC801	C-9
IC802	C-4
IC803	C-5
IC851	H-3
IC852	H-4
IC891	H-1
Q701	C-2
Q702	A-3
Q703	A-4
Q704	B-3
Q851	H-2
Q852	G-2

CP-71 (CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92 (LINE IN 4)
HF-34 (AUDIO PROCESS)
DC-66 (RELAY)
PV-17 (PDC/VPS CONTROL)
ACE HEAD
RV-44 (HEAD AMP, Y/C VIDEO PROCESS)
MF-273 (VR, HEAD PHONE JACK)
PS-345 (POWER)
MF-271 (TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR (M902)
DRUM MOTOR (M901)
MA-241 (SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR (M903)
MF-272 (MODE CONTROL)

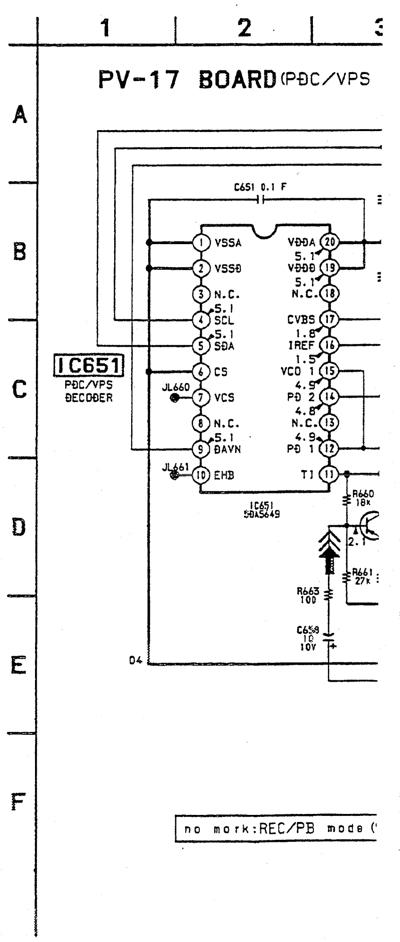
PV-17 (PDC/VPS CONTROL)

— Ref. No. PV-17 BOARD : 3,

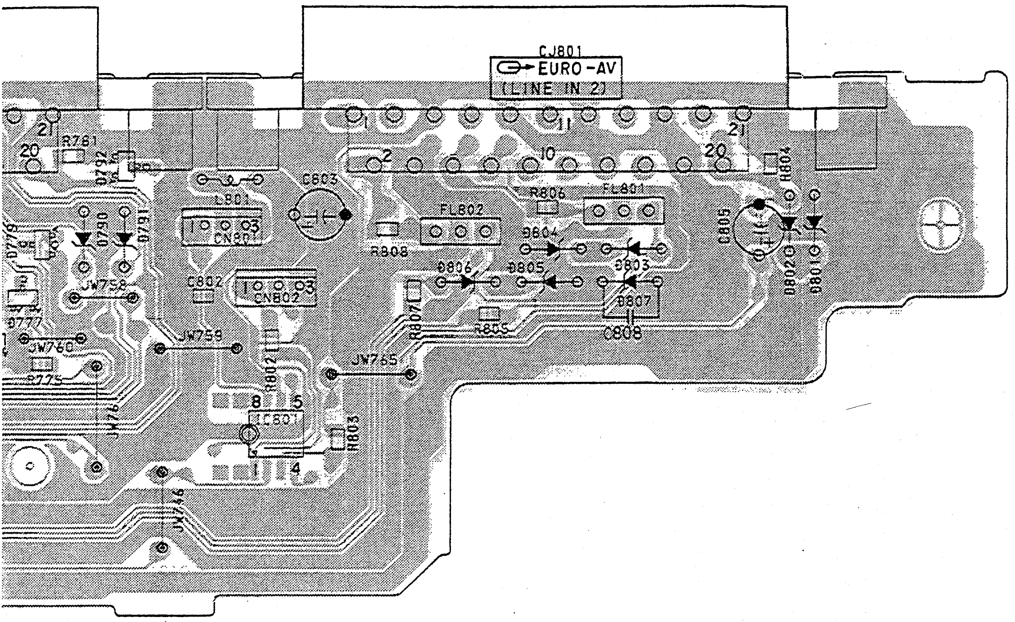

PV-17 BOARD
IC652
X651
C666
04

PV-17 (PDC/VPS CONTROL)

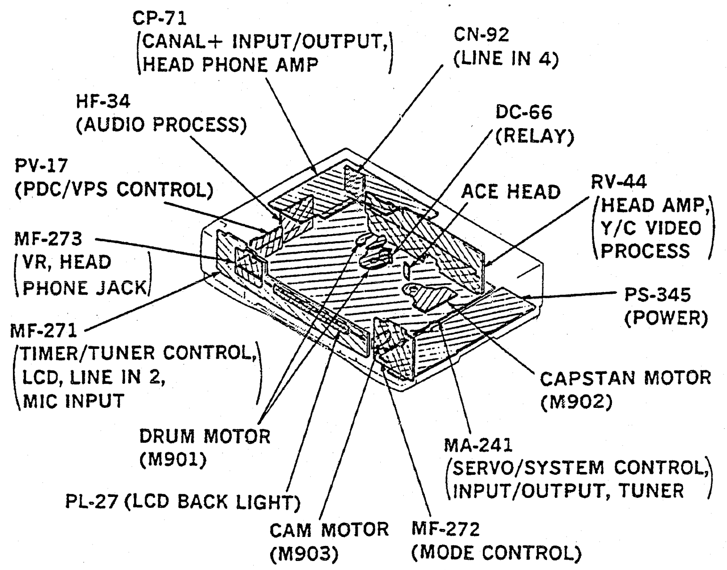
— Ref. No. PV-17 BOARD : 3


PV-17 BOARD (PDC/VPS
IC651
PDC/VPS DECODER
A
B
C
D
E
F
1
2
04
no mark:REC/PB mode

- There are few cases that the part isn't mounted in this model is printed on this diagram.


CJ801
EURO-AV
(LINE IN 2)
R761
L801
CN801
FL802
FL801
R806
C803
C805
D804
D805
D806
D803
D807
C808
C802
CN802
R808
R805
R807
R802
IC801
R803
JW758
JW759
JW760
JW765
JW746
D801
D802
R804

CP-71 BOARD	
D701	A-3
D775	B-7
D777	B-7
D779	B-7
D782	B-5
D783	B-5
D784	B-6
D785	B-7
D786	B-6
D787	B-6
D788	B-7
D789	A-6
D790	A-8
D791	A-8
D792	A-8
D794	A-4
D801	B-11
D802	B-11
D803	B-11
D804	B-10
D805	B-10
D806	B-10
D807	B-11
D851	G-4
D852	H-4
D853	G-3
IC701	B-3
IC751	F-4
IC752	F-3
IC801	C-9
IC802	C-4
IC803	C-5
IC851	H-3
IC852	H-4
IC891	H-1
Q701	C-2
Q702	A-3
Q703	A-4
Q704	B-3
Q851	H-2
Q852	G-2

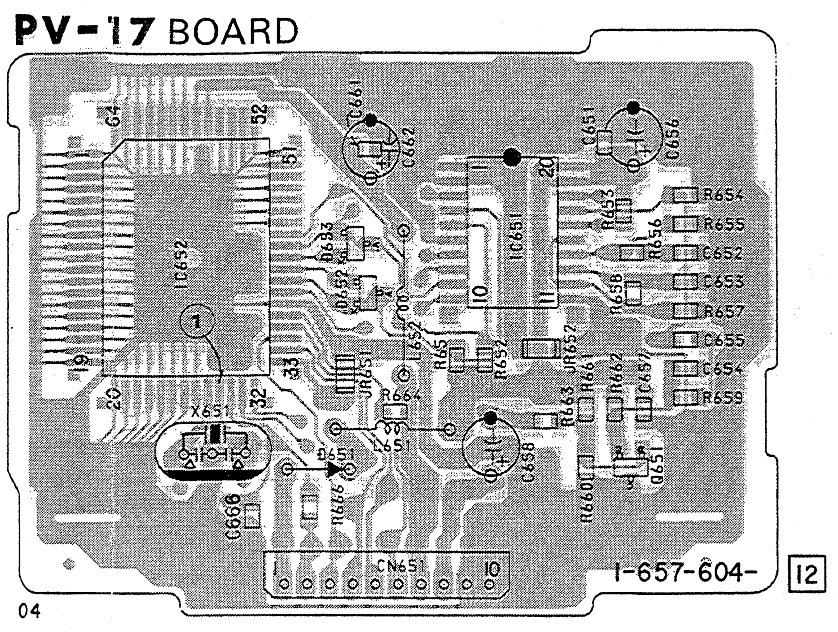

CP-71
(CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
MF-273
(VR, HEAD PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)

7 | 8 | 9 | 10 | 11 | 12

PV-17 (PDC/VPS CONTROL) PRINTED WIRING BOARD

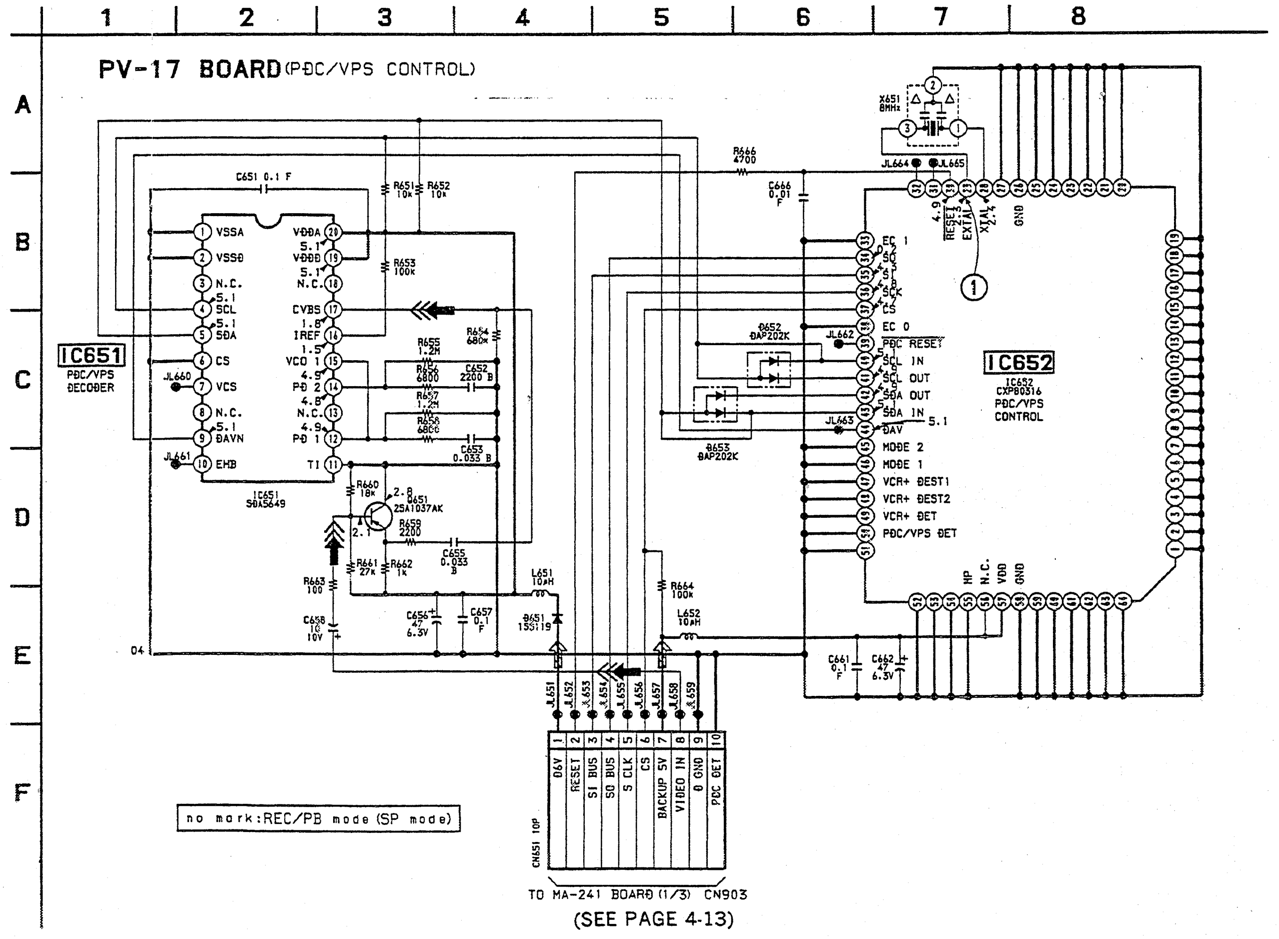
—Ref. No. PV-17 BOARD : 3,000 series—

- There are few cases that the part isn't mounted in this model is printed on this diagram.


PV-17 BOARD
IC652
IC651
X651
C661
C662
C651
C656
R654
R655
C652
C653
R657
C655
C654
R659
R653
R656
R658
D652
D653
L652
JR651
R664
L651
C658
C660
R663
R661
R662
C657
R660
Q651
D651
R666
CN651
1-657-604-
12
04

PV-17 (PDC/VPS CONTROL) SCHEMATIC DIAGRAM

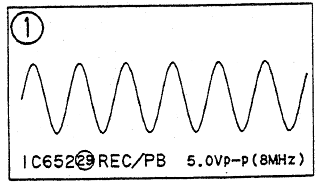
—Ref. No. PV-17 BOARD : 3,000 series—


1
2
3
4
5
6
7
8
A
B
C
D
E
F
PV-17 BOARD(PDC/VPS CONTROL)
IC651
PDC/VPS DECODER
IC651 SDA5649
VSSA
VSSD
N.C.
SCL
SDA
CS
VCS
N.C.
DAVN
EHB
VDDA
VDDD
N.C.
CVBS
IREF
VCO 1
PD 2
N.C.
PD 1
T1
C651 0.1 F
R651 10k
R652 10k
R653 100k
R655 1.2M
R654 680k
C652 2200 B
C653 0.033 B
R660 18k
Q651 2SA1037AK
R659 2200
C655 0.033
R661 27k
R662 1k
R663 100
C658 10 10V
C654 47 6.3V
C657 0.1 F
L651 10μH
D651 1SS119
R664 100k
L652 10μH
C661 0.1 F
C662 47 6.3V
X651 8MHz
R666 4700
C666 0.01 F
IC652
IC652 CXP80316 PDC/VPS CONTROL
D652 DAP202K
D653 DAP202K
RESET
EXTAL
XTAL
GND
PDC RESET
SCL IN
SCL OUT
SDA OUT
SDA IN
DAV
MODE 2
MODE 1
VCR+ DEST1
VCR+ DEST2
VCR+ DET
PDC/VPS DET
HP
N.C.
VDD
04
JL651
JL652
JL653
JL654
JL655
JL656
JL657
JL658
JL659
D6V
RESET
SI BUS
SO BUS
S CLK
CS
BACKUP 5V
VIDEO IN
D GND
PDC DET
CN651 10P
no mark:REC/PB mode (SP mode)

TO MA-241 BOARD (1/3) CN903

(SEE PAGE 4-13)

PV-17 BOARD



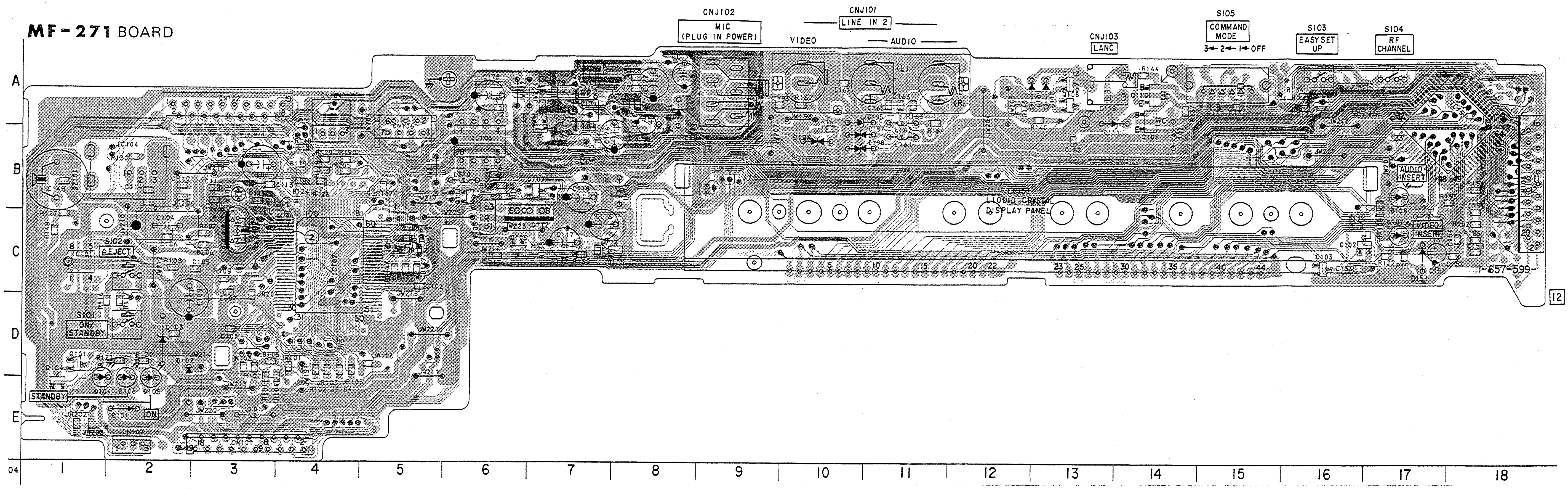
MF-271 (TIMER/TUNER/LCD CONTROL, LINE IN 2) MF-272 (MODE CONTROL) MF-273 (VR, HEADPHONE JACK) PL-27 (LCD BACK LIGHT) PRINTED WIRING BOARDS

— Ref. No. MF-271 BOARD, MF-272 BOARD, MF-273 BOARD : 3,000 series, PL-27 BOARD : 5,000 series —

- There are few cases that the part isn't mounted in this model is printed on this diagram.

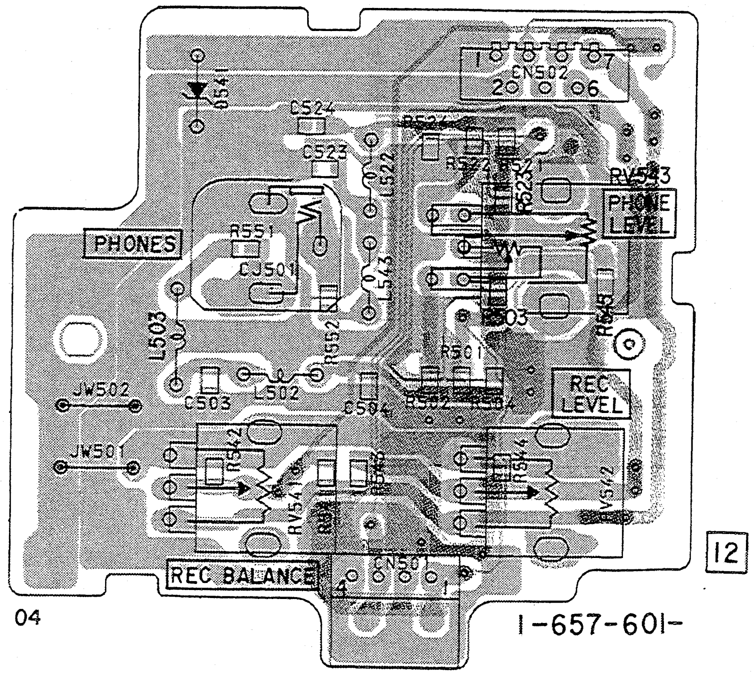
▨ : Pattern of the rear side

MF-271 BOARD

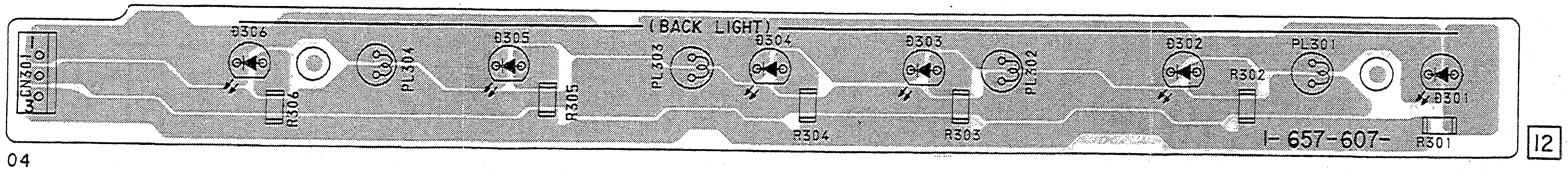

CNJ102
MIC
(PLUG IN POWER)
CNJ101
LINE IN 2
VIDEO
AUDIO
CNJ103
LANC
S105
COMMAND MODE
3←2←1←OFF
S103
EASY SET UP
S104
RF CHANNEL
S102
EJECT
S101
ON/STANDBY
STANDBY
ON
AUDIO INSERT
VIDEO INSERT
LIQUID CRYSTAL DISPLAY PANEL
1-657-599-
12
A
B
C
D
E
04
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

MF-271 BOARD	
D101	E-2
D102	D-2
D104	E-1
D105	E-2
D106	E-2
D107	C-17
D108	B-17
D109	A-13
D110	A-13
D111	B-13
D151	C-17
D194	A-8
D195	B-10
D196	B-10
D197	B-10
D198	B-10
IC101	C-1
IC102	C-4
IC103	B-6
IC104	B-2
IC151	A-18
IC171	A-7
Q101	D-1
Q102	C-16
Q103	C-16
Q104	D-1
Q105	C-8
Q106	B-14
Q107	B-7
Q108	A-13
Q109	C-6
Q110	A-14
Q111	B-6
Q112	C-7
Q113	A-13
Q171	A-7

MF-273 BOARD

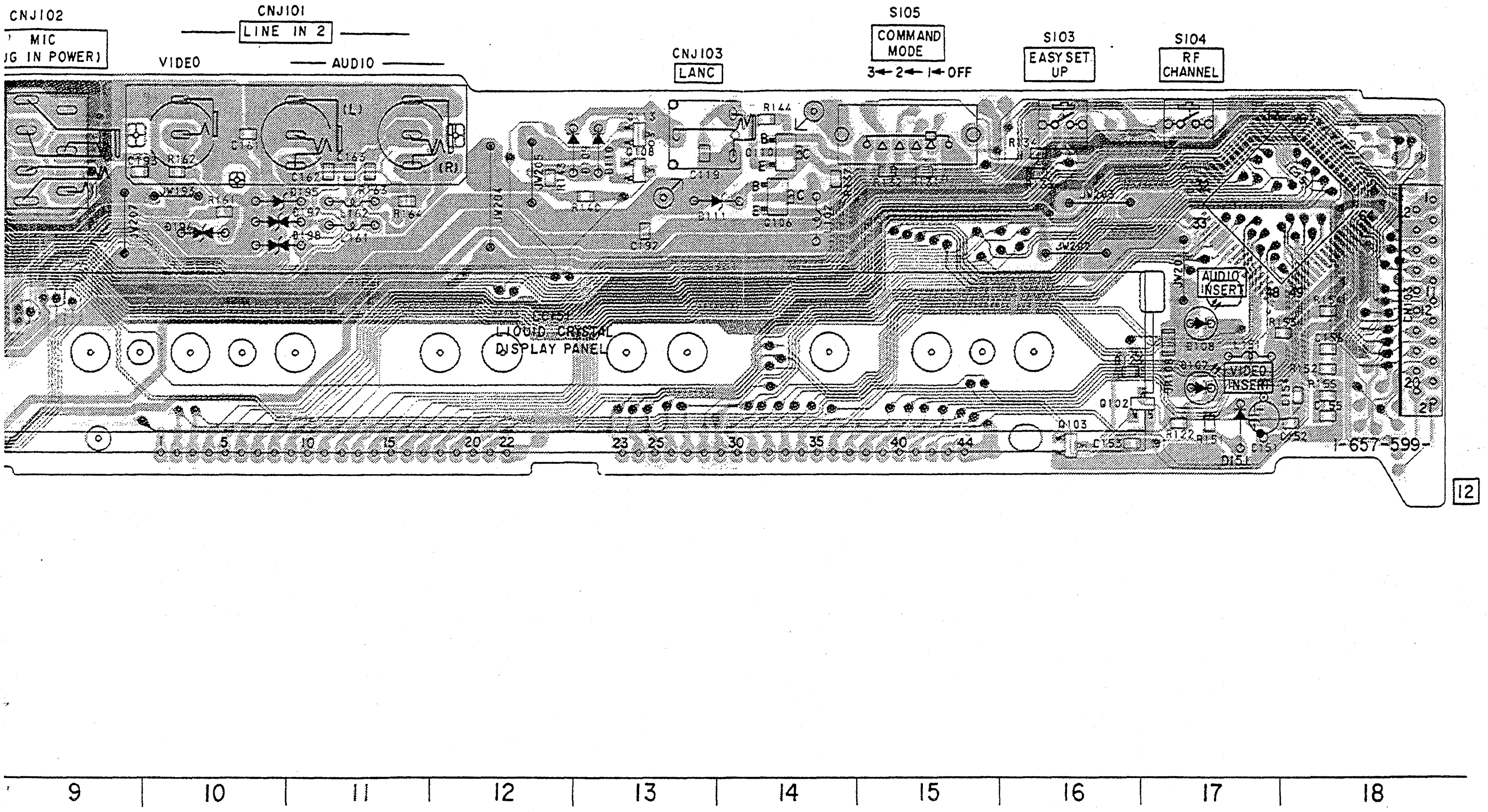

CN502
D541
C524
C523
R522
PHONES
R551
CJ501
L503
JW502
JW501
C503
L502
C504
R552
RV543
PHONE LEVEL
REC LEVEL
REC BALANCE
RV541
RV542
CN501
04
1-657-601-
12

PL-27 BOARD


(BACK LIGHT)
CN301
D306
D305
D304
D303
D302
D301
PL301
PL302
PL303
PL304
R301
R302
R303
R304
R305
R306
04
1-657-607-
12

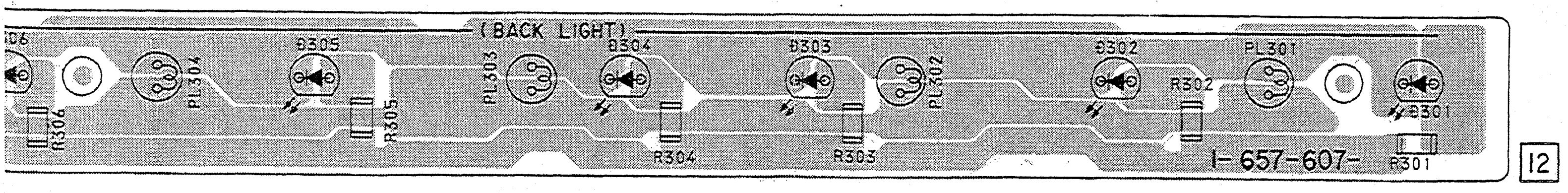
- There are few cases that the part isn't mounted in this model is printed on this diagram.

▨ : Pattern of the rear side

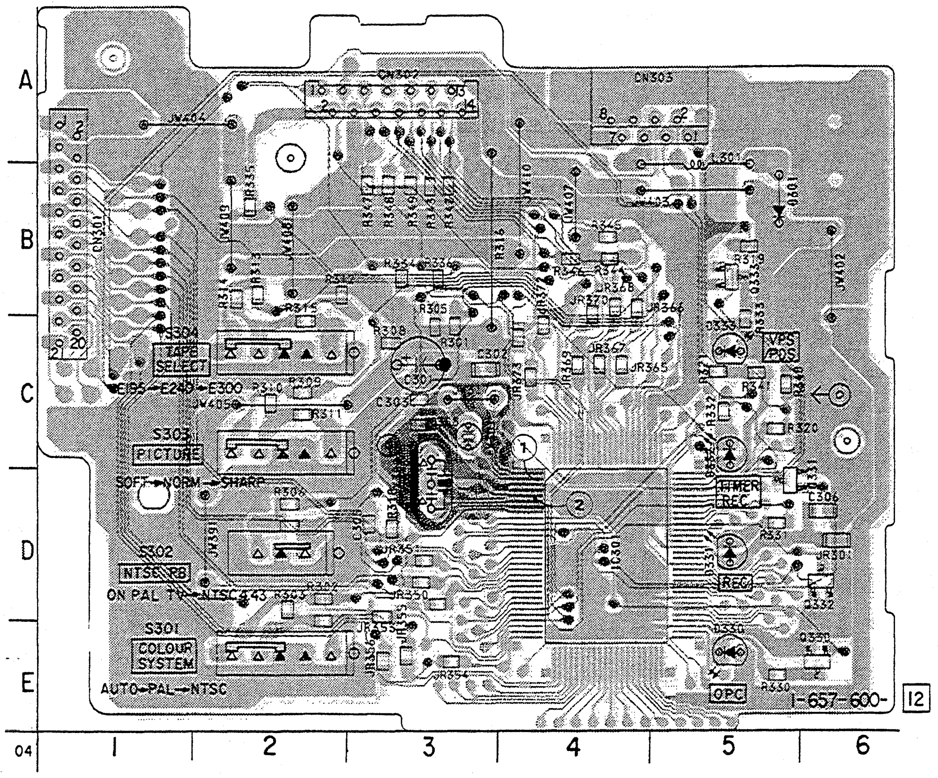

CNJ102
MIC
(PLUG IN POWER)
CNJ101
LINE IN 2
VIDEO
AUDIO
(L)
(R)
CNJ103
LANC
S105
COMMAND MODE
3→2→1→OFF
S103
EASY SET UP
S104
RF CHANNEL
LIQUID CRYSTAL DISPLAY PANEL
AUDIO INSERT
VIDEO INSERT
1-657-599-
12
9
10
11
12
13
14
15
16
17
18

MF-271 BOARD	
D101	E-2
D102	D-2
D104	E-1
D105	E-2
D106	E-2
D107	C-17
D108	B-17
D109	A-13
D110	A-13
D111	B-13
D151	C-17
D194	A-8
D195	B-10
D196	B-10
D197	B-10
D198	B-10
IC101	C-1
IC102	C-4
IC103	B-6
IC104	B-2
IC151	A-18
IC171	A-7
Q101	D-1
Q102	C-16
Q103	C-16
Q104	D-1
Q105	C-8
Q106	B-14
Q107	B-7
Q108	A-13
Q109	C-6
Q110	A-14
Q111	B-6
Q112	C-7
Q113	A-13
Q171	A-7

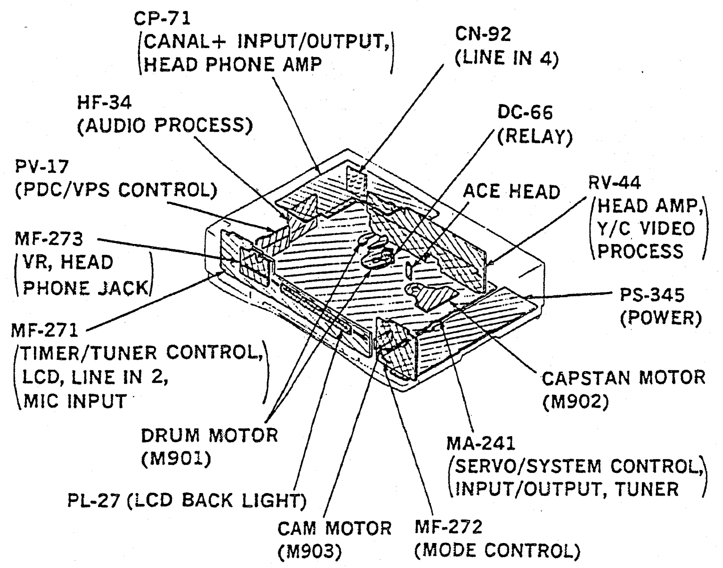
D


(BACK LIGHT)
D305
D304
D303
D302
D301
PL304
PL303
PL302
PL301
R306
R305
R304
R303
R302
R301
1-657-607-
12

MF-272 BOARD


A
B
C
D
E
CN303
S304
TAPE SELECT
E195→E240→E300
S303
PICTURE
SOFT→NORM→SHARP
S302
NTSC PB
ON PAL TV→NTSC 4.43
S301
COLOUR SYSTEM
AUTO→PAL→NTSC
VPS/PDS
TIMER REC
REC
OPC
1-657-600-
12
04
1
2
3
4
5
6

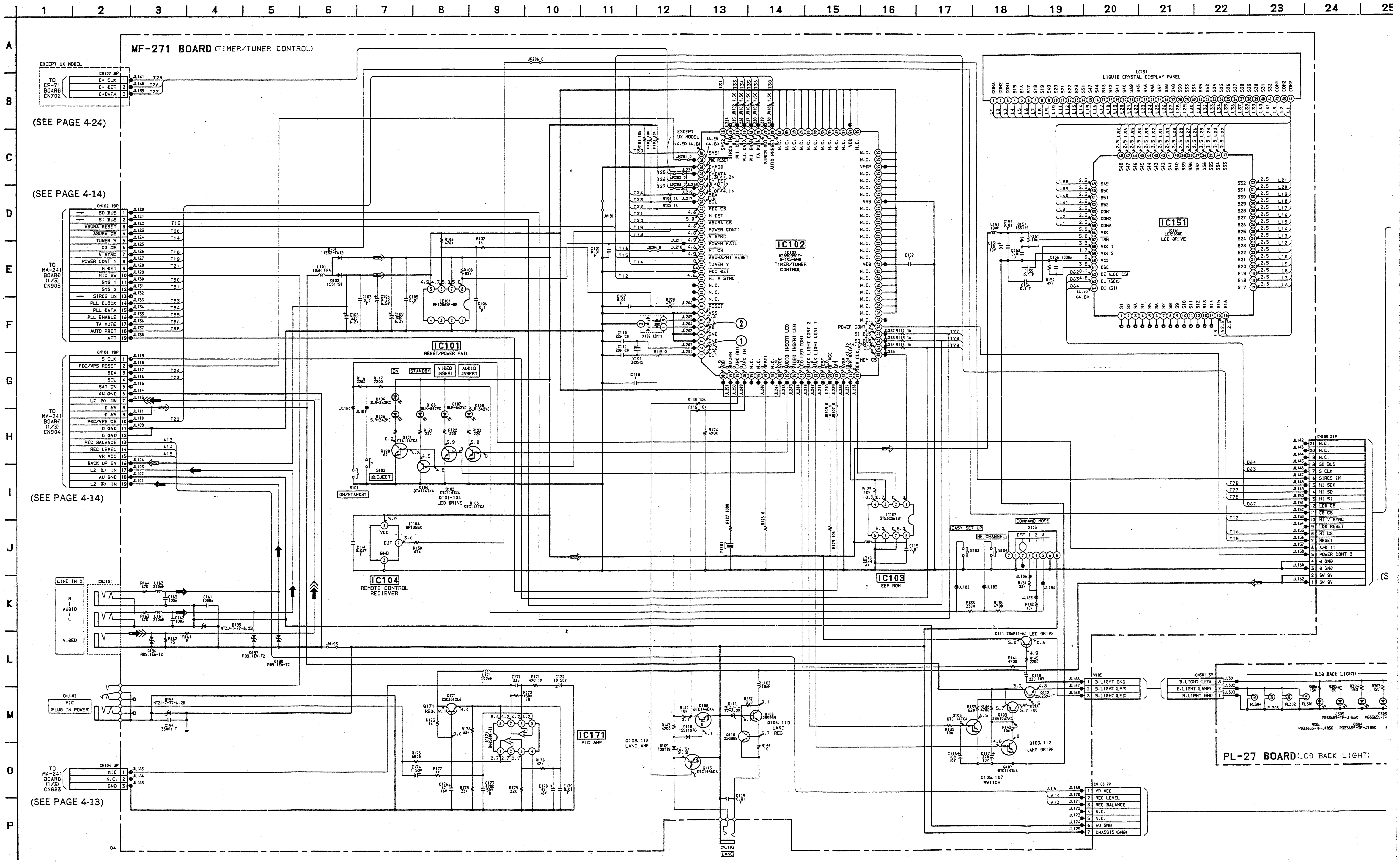
MF-272 BOARD	
D301	B-5
D330	E-5
D331	D-5
D332	C-5
D333	C-5
IC301	D-4
Q330	E-6
Q331	D-5
Q332	D-6
Q333	B-5


CP-71
(CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
MF-273
(VR, HEAD PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)

MF-271 (TIMER/TUNER/LCD CONTROL, LINE IN 2) MF-272 (MODE CONTROL)
MF-273 (VR, HEADPHONE JACK) PL-27 (LCD BACK LIGHT) SCHEMATIC DIAGRAMS

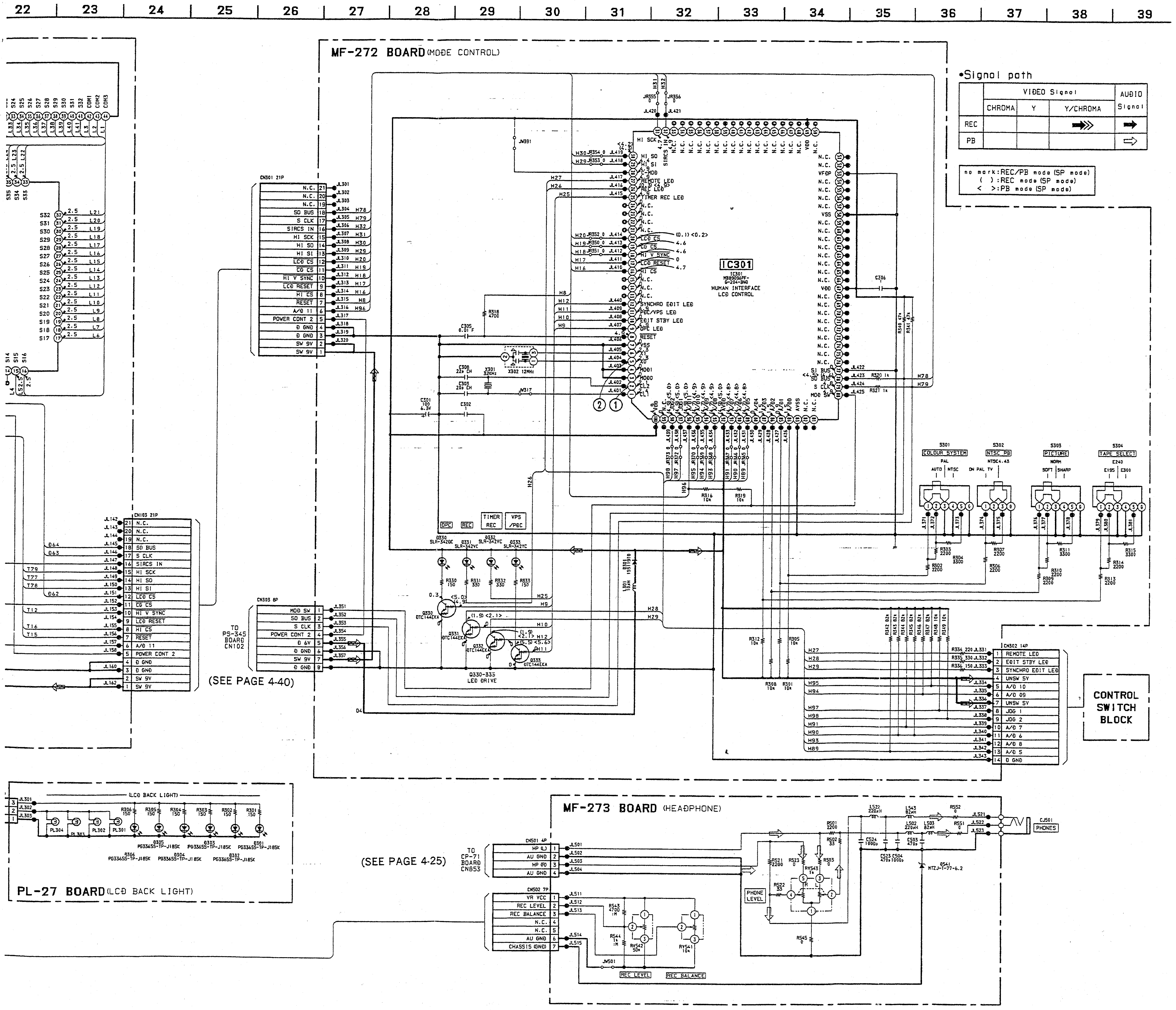
— Ref. No. MF-271 BOARD, MF-272 BOARD, MF-273 BOARD : 3,000 series, PL-27 BOARD : 5,000 series —

- Control switch block is replaced as block, so that printed wiring board and schematic diagram is omitted.



MF-271 BOARD (TIMER/TUNER CONTROL)
EXCEPT UX MODEL
TO CP-71 BOARD CN702
(SEE PAGE 4-24)
(SEE PAGE 4-14)
TO MA-241 BOARD (1/3) CN905
TO MA-241 BOARD (1/3) CN904
(SEE PAGE 4-14)
LINE IN 2
R AUDIO L
VIDEO
MIC (PLUG IN POWER)
TO MA-241 BOARD (1/3) CN883
(SEE PAGE 4-13)
IC101 RESET/POWER FAIL
IC102 TIMER/TUNER CONTROL
IC103 EEP ROM
IC104 REMOTE CONTROL RECIEVER
IC171 MIC AMP
IC151 LCD DRIVE
LC151 LIQUID CRYSTAL DISPLAY PANEL
S101 ON/STANDBY
S102 EJECT
ON
STANDBY
VIDEO INSERT
AUDIO INSERT
Q101-104 LED DRIVE
EASY SET UP
RF CHANNEL
COMMAND MODE
Q111 LED DRIVE
Q105, 107 SWITCH
Q105, 112 LAMP DRIVE
Q106, 110 LANC REG
Q108, 113 LANC AMP
CN103 LANC
CN103 21P
CN106 7P
B.LIGHT GND
B.LIGHT (LAMP)
B.LIGHT (LED)
PL-27 BOARD (LCD BACK LIGHT)
(LCD BACK LIGHT)

m is omitted.

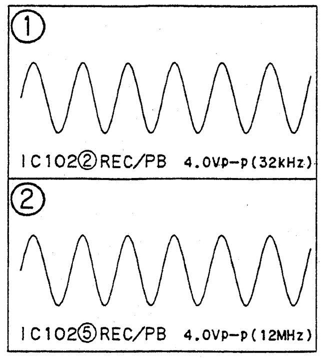

MF-272 BOARD (MODE CONTROL)
IC301
MB89PAPF-
HUMAN INTERFACE
LCD CONTROL
CN301 21P
CN103 21P
CN303 8P
TO PS-345 BOARD CN102
(SEE PAGE 4-40)
CN302 14P
CONTROL SWITCH BLOCK
S301 COLOUR SYSTEM
S302 NTSC PB
S303 PICTURE
S304 TAPE SELECT
Q330-335 LED DRIVE
OPC
REC
TIMER REC
VPS /PBC
PL-27 BOARD (LCD BACK LIGHT)
(LCD BACK LIGHT)
MF-273 BOARD (HEADPHONE)
TO CP-71 BOARD CN853
(SEE PAGE 4-25)
CN501 4P
CN502 7P
PHONE LEVEL
REC LEVEL
REC BALANCE
CJ501 PHONES

•Signal path

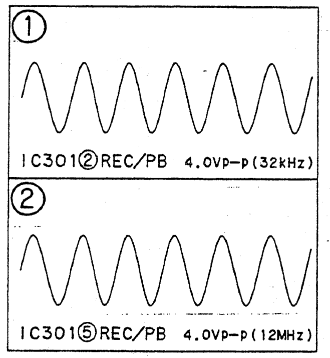
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			⇛	➡
PB				⇨

no mark : REC/PB mode (SP mode)
( ) : REC mode (SP mode)
< > : PB mode (SP mode)

MF-271 BOARD



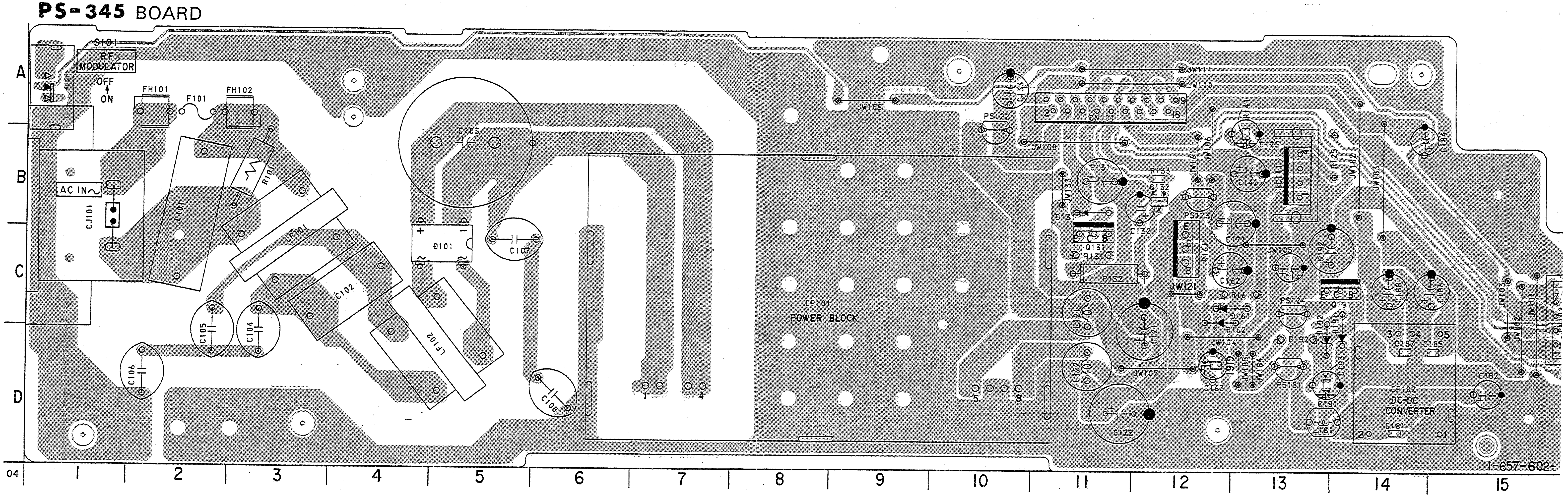
MF-272 BOARD

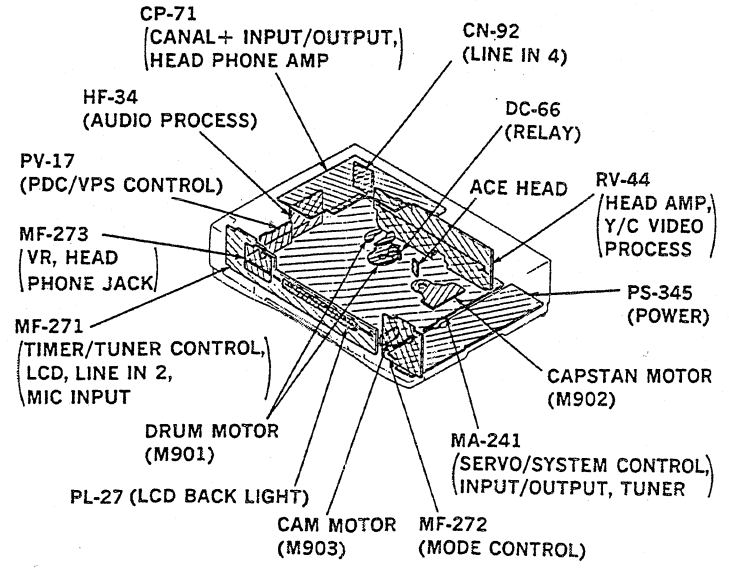


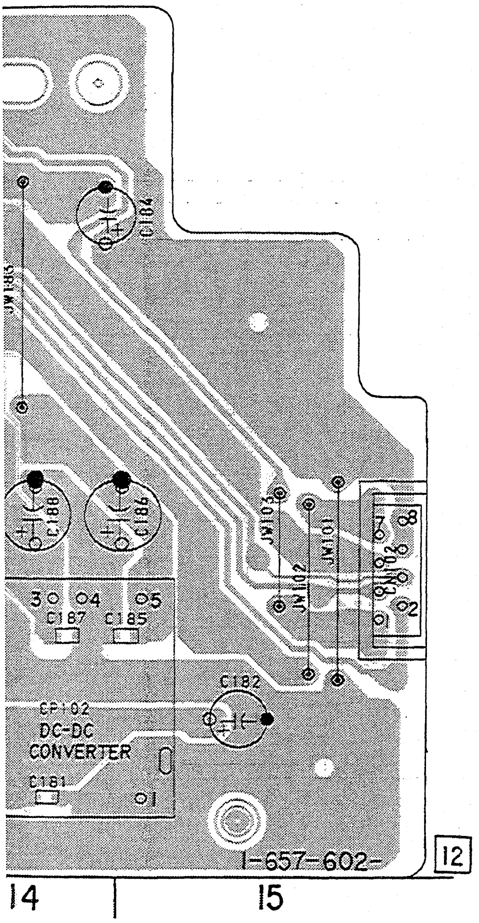
PS-345 (POWER) PRINTED WIRING BOARD

— Ref. No. PS-345 BOARD : 6,000 series —

- There are few cases that the part isn't mounted in this model is printed on this diagram.


PS-345 BOARD
S101
RF MODULATOR
OFF
ON
FH101
F101
FH102
AC IN~
CJ101
C101
R101
LF101
D101
C103
C107
C102
LF102
C104
C105
C106
C108
CP101
POWER BLOCK
JW109
PS122
C135
CN101
JW111
JW110
JW108
R141
C125
C131
R133
C132
Q131
R131
R132
PS123
Q161
C171
C142
IC141
R125
JW182
JW183
C184
JW105
C192
C162
C141
JW121
R161
D161
D162
PS124
Q191
C188
C186
L121
C121
L122
C122
JW104
JW107
C161
C163
JW185
JW184
PS181
R192
D192
D191
D193
C191
L181
C187
C185
CP102
DC-DC CONVERTER
C181
C182
JW103
JW102
JW101
A
B
C
D
04
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1-657-602-

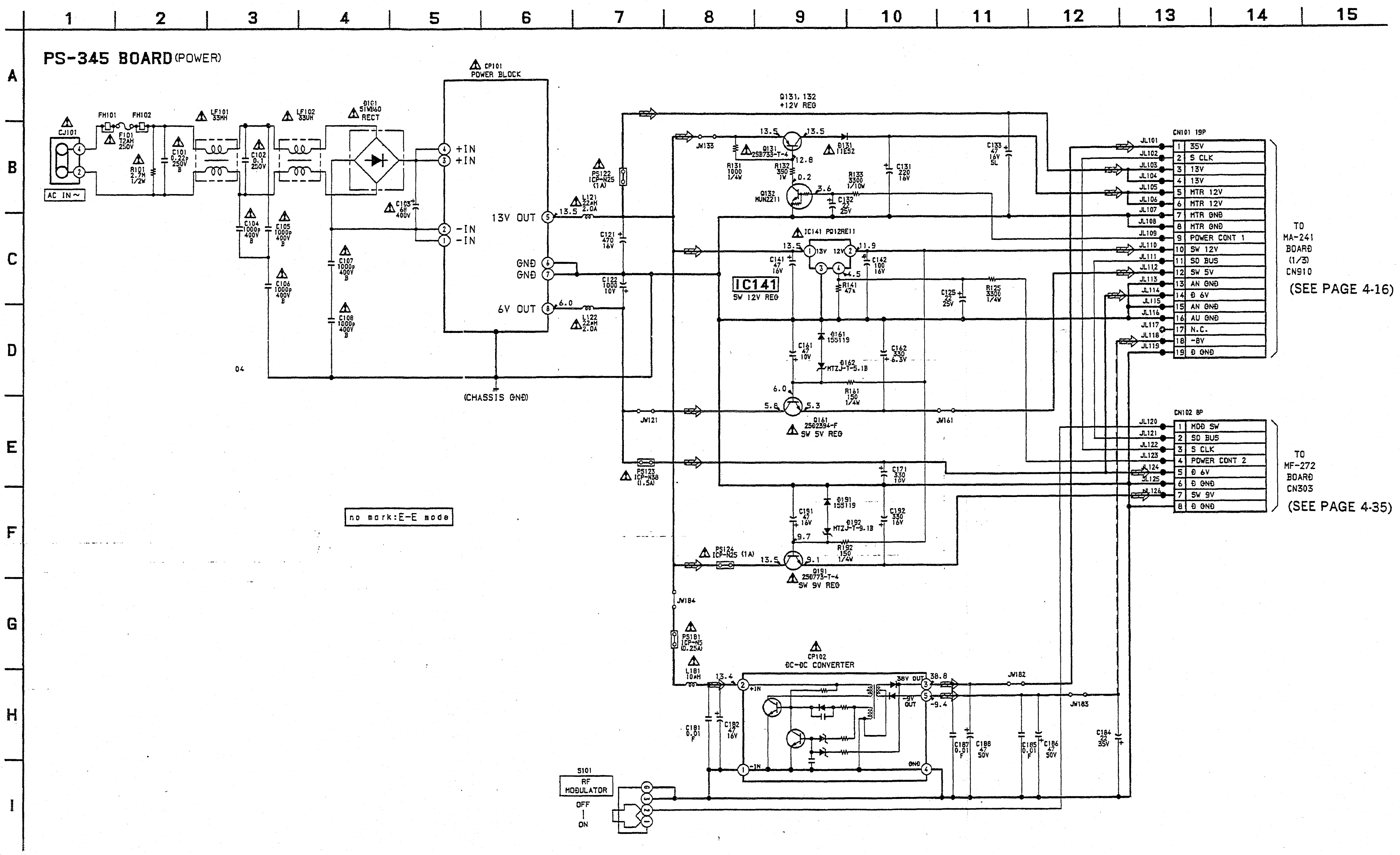

CP-71
(CANAL+ INPUT/OUTPUT, HEAD PHONE AMP)
CN-92
(LINE IN 4)
HF-34
(AUDIO PROCESS)
DC-66
(RELAY)
PV-17
(PDC/VPS CONTROL)
ACE HEAD
RV-44
(HEAD AMP, Y/C VIDEO PROCESS)
MF-273
(VR, HEAD PHONE JACK)
PS-345
(POWER)
MF-271
(TIMER/TUNER CONTROL, LCD, LINE IN 2, MIC INPUT)
CAPSTAN MOTOR
(M902)
DRUM MOTOR
(M901)
MA-241
(SERVO/SYSTEM CONTROL, INPUT/OUTPUT, TUNER)
PL-27 (LCD BACK LIGHT)
CAM MOTOR
(M903)
MF-272
(MODE CONTROL)


C104
C188
C186
JW105
JW101
JW102
CN102
C187
C185
C182
CP102
DC-DC
CONVERTER
C181
1-657-602-
12
14
15

PS-345 BOARD	
D101	C-5
D131	B-11
D161	C-13
D162	C-13
D191	C-14
D192	C-13
IC141	B-13
Q131	C-11
Q132	B-12
Q161	C-12
Q191	C-14

PS-345 (POWER) SCHEMATIC DIAGRAM

— Ref. No. PS-345 BOARD : 3,000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
PS-345 BOARD (POWER)
CJ101
AC IN ~
FH101
FH102
F101
R101
C101
LF101
LF102
C102
C104
C105
C106
C107
C108
D101 S1WB60 RECT
C103
CP101 POWER BLOCK
+IN
+IN
-IN
-IN
13V OUT
GND
GND
6V OUT
(CHASSIS GND)
PS122
L121
L122
C121
C122
Q131, 132 +12V REG
Q131 2SB733-T-4
Q132 MUN2211
D131 11ES2
R131
R132
R133
C131
C132
C133
JW133
IC141 PQ12RE11
IC141 5V 12V REG
C141
C142
R141
D161 1SS119
D162 MTZJ-T-5.1B
C161
C162
R161
Q161 2SD2394-F 5V 5V REG
JW121
JW161
PS123
C171
C125
R125
D191 1SS119
D192 MTZJ-T-9.1B
C191
C192
R192
PS124
Q191 2SB733-T-4 5V 9V REG
JW184
PS191
L181
CP102 DC-DC CONVERTER
C181
C182
C184
C185
C186
C187
C188
JW182
JW183
S101 RF MODULATOR
OFF
ON
no mark: E-E mode
CN101 19P
1 35V
2 S CLK
3 13V
4 13V
5 MTR 12V
6 MTR 12V
7 MTR GND
8 MTR GND
9 POWER CONT 1
10 SW 12V
11 SD BUS
12 SW 5V
13 AN GND
14 D 6V
15 AN GND
16 AU GND
17 N.C.
18 -8V
19 D GND
TO MA-241 BOARD (1/3) CN910
(SEE PAGE 4-16)
CN102 8P
1 MOD SW
2 SD BUS
3 S CLK
4 POWER CONT 2
5 D 6V
6 D GND
7 SW 9V
8 D GND
TO MF-272 BOARD CN303
(SEE PAGE 4-35)

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 5
REPAIR PARTS LIST

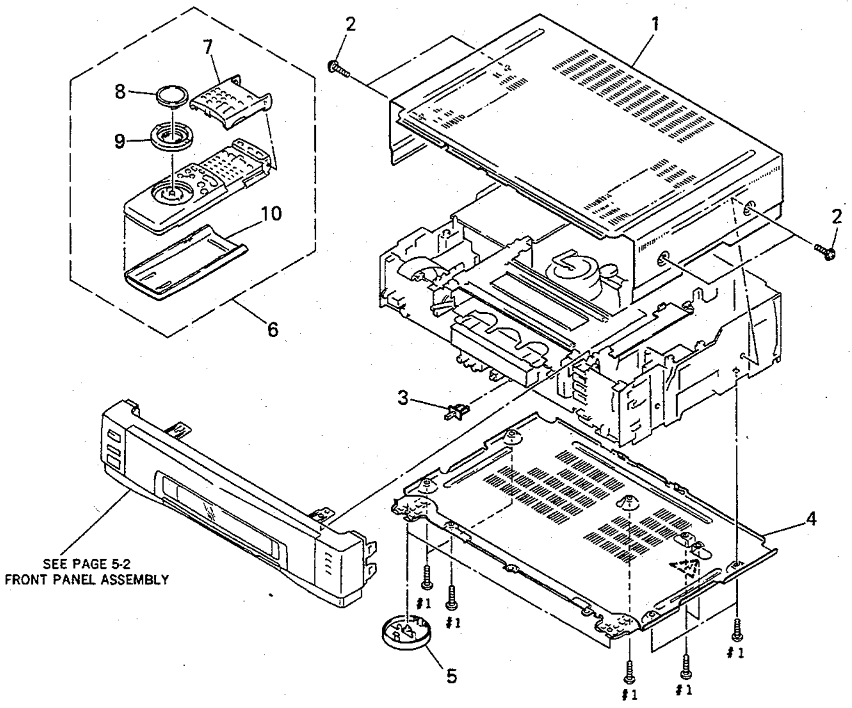
5-1. EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

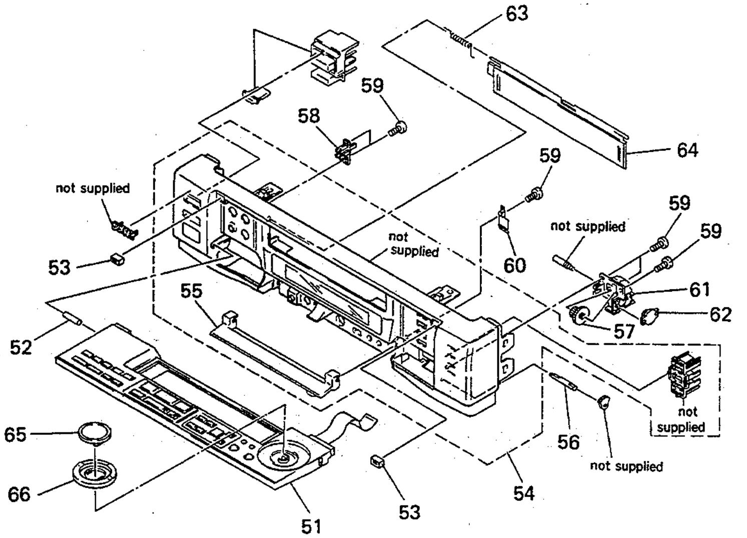
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1-1. CASE ASSEMBLY



Ref. No.	Part No.	Description	Remark
1	3-960-475-01	CASE, UPPER	
2	3-710-901-11	SCREW (TP3X8), CASE	
3	3-958-012-01	KNOB, SELECTION	
4	3-960-410-01	PLATE, BOTTOM	
5	3-960-062-11	INSULATOR	
6	1-473-267-11	REMOTE COMMANDER (V174) (NP, VC)	
6	1-473-267-21	REMOTE COMMANDER (V174A) (B)	
6	1-473-267-31	REMOTE COMMANDER (V174B) (UX)	
6	1-473-267-41	REMOTE COMMANDER (V174C) (AS, NZ)	
7	3-708-924-11	COVER (V174, V174B, V174C) (AS, NP, NZ, UX, VC)	
7	3-708-924-21	COVER (V174A) (B)	
8	3-955-359-51	DIAL, JOG	
9	3-955-358-01	RING, SHUTTLE	
10	3-954-582-11	COVER, SLIDE	

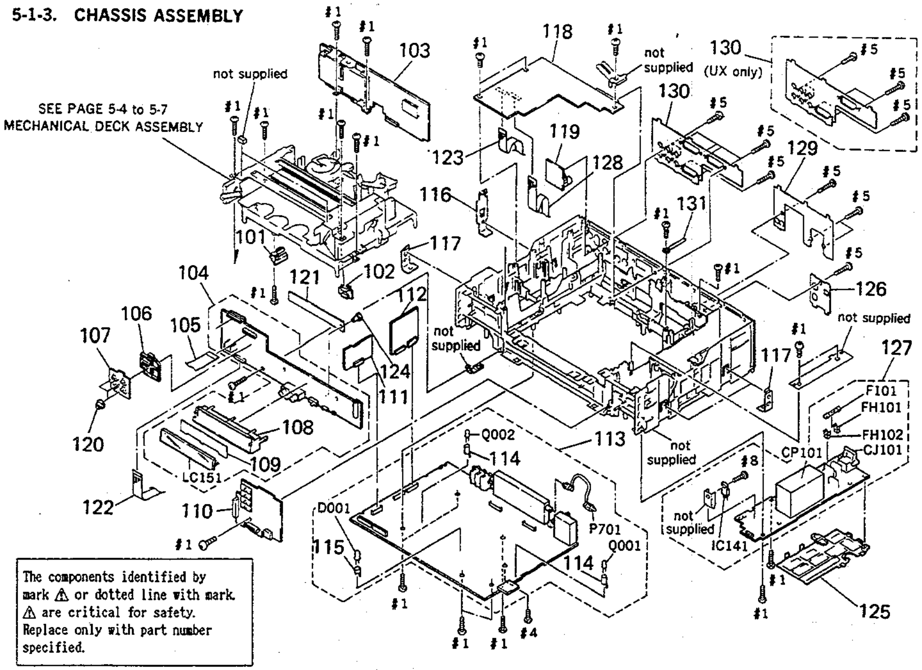
5-1-2. FRONT PANEL ASSEMBLY


63
59
58
64
59
not supplied
59
59
not supplied
not supplied
60
53
55
61
62
57
52
not supplied
56
not supplied
65
66
53
54
51

Ref. No.	Part No.	Description	Remark
51	1-473-291-11	SWITCH BLOCK, CONTROL (VC)	
51	1-473-291-21	SWITCH BLOCK, CONTROL (B)	
51	1-473-291-31	SWITCH BLOCK, CONTROL (NP)	
51	1-473-291-41	SWITCH BLOCK, CONTROL (UX)	
51	1-473-291-51	SWITCH BLOCK, CONTROL (AS, NZ)	
52	3-965-267-01	SHAFT (L), FULCRUM	
53	3-736-779-41	MAGNET	
54	X-3945-327-1	PANEL ASSY, FRONT (AS, NP, NZ, UX, VC)	
54	X-3945-362-1	PANEL ASSY, FRONT (B)	
55	3-965-273-01	DOOR, JACK (AS, NP, NZ, UX, VC)	
55	3-965-273-11	DOOR, JACK (B)	
56	3-965-279-01	SHAFT (R), FULCRUM GEAR	

Ref. No.	Part No.	Description	Remark
57	3-953-505-01	GEAR (A), RELAY	
58	3-965-266-01	PLATE (L), FULCRUM	
59	4-921-277-31	SCREW (B2.6X12), TAPPING, BIND	
60	3-965-277-01	SPRING, DOOR	
61	3-965-278-01	PLATE (R), FULCRUM	
62	3-319-224-01	DAMPER, SMALL	
63	3-953-432-01	SPRING (GE), FL	
64	3-960-094-31	DOOR, CASSETTE (AS, NP, NZ, UX, VC)	
64	3-960-094-41	DOOR, CASSETTE (B)	
65	3-955-359-51	DIAL, JOG	
66	3-955-358-01	RING, SHUTTLE	

5-1-3. CHASSIS ASSEMBLY

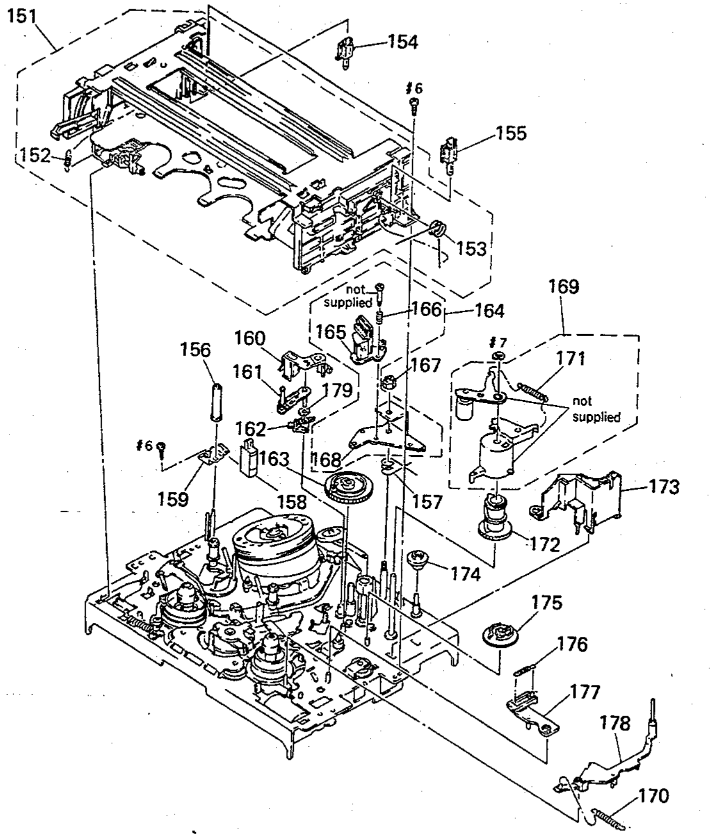

not supplied
SEE PAGE 5-4 to 5-7
MECHANICAL DECK ASSEMBLY
103
118
130
(UX only)
not supplied
130
119
128
123
116
129
131
117
101
102
121
104
106
105
107
112
124
111
126
not supplied
not supplied
127
117
F101
FH101
FH102
CJ101
CP101
120
108
109
LC151
122
110
Q002
114
113
not supplied
D001
115
P701
Q001
114
not supplied
IC141
125
#1
#4
#5
#8

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 101	3-960-067-11	HOLDER, MA	
* 102	A-6794-089-A	DC-66 BOARD, COMPLETE	
* 103	A-6782-680-A	RV-44 BOARD, COMPLETE (AS, NP, NZ, UX, VC)	
* 103	A-6782-689-A	RV-44 BOARD, COMPLETE (B)	
* 104	A-6782-682-A	MF-271 BOARD, COMPLETE (VC)	
* 104	A-6782-685-A	MF-271 BOARD, COMPLETE (UX)	
* 104	A-6782-691-A	MF-271 BOARD, COMPLETE (B)	
* 104	A-6796-120-A	MF-271 BOARD, COMPLETE (NP)	
* 104	A-6796-226-A	MF-271 BOARD, COMPLETE (NZ)	
* 104	A-6796-227-A	MF-271 BOARD, COMPLETE (AS)	
105	1-775-403-11	WIRE, FLAT TYPE (FMF-12) 19P	
* 106	3-965-270-01	HOLDER, MF	
* 107	A-6782-683-A	MF-273 BOARD, COMPLETE	
* 108	3-965-271-01	HOLDER, LCD	
* 109	3-965-272-01	SHEET (A), DIFFUSION	
* 110	A-6782-676-A	MF-272 BOARD, COMPLETE	
* 111	A-6782-677-A	PV-17 BOARD, COMPLETE	
* 112	A-6721-595-A	HF-34 BOARD, COMPLETE	
* 113	A-6782-681-A	MA-241 BOARD, COMPLETE (AS, VC)	
* 113	A-6782-688-A	MA-241 BOARD, COMPLETE (UX)	
* 113	A-6782-690-A	MA-241 BOARD, COMPLETE (B)	
* 113	A-6782-692-A	MA-241 BOARD, COMPLETE (NP, NZ)	
* 114	3-960-273-01	SPACER, TOP END	
* 115	3-960-274-01	SPACER, LED	
* 116	3-960-571-11	PLATE, FIXED (LARGE), BOTTOM	
117	3-741-992-01	STOPPER, UPPER CASE	
* 118	A-6782-679-A	CP-71 BOARD, COMPLETE (AS, B, NP, NZ, VC)	
* 118	A-6782-687-A	CP-71 BOARD, COMPLETE (UX)	
* 119	A-6782-675-A	CN-92 BOARD, COMPLETE	
120	3-966-065-01	KNOB, VR	
* 121	A-6782-684-A	PL-27 BOARD, COMPLETE	
122	1-775-404-11	WIRE, FLAT TYPE (FMF-13) 19P	
123	1-775-405-11	WIRE, FLAT TYPE (FCP-9) 11P	

Ref. No.	Part No.	Description	Remark
124	3-957-327-01	RIVET, PUSH	
* 125	3-960-066-11	INSULATOR, PS	
* 126	3-960-464-01	PLATE, ORNAMENTAL (TU), REAR (AS, NP, NZ, UX, VC)	
* 126	3-960-464-11	PLATE, ORNAMENTAL (TU), REAR JACK (B)	
* 127	A-6782-678-A	PS-345 BOARD, COMPLETE (AS, B, NP, NZ, VC)	
* 127	A-6782-686-A	PS-345 BOARD, COMPLETE (UX)	
128	1-775-406-11	WIRE, FLAT TYPE (FCP-10) 15P (AS, B, NP, NZ, VC)	
* 129	3-965-406-01	PLATE, ORNAMENTAL (PS), REAR (VC)	
* 129	3-965-406-11	PLATE, ORNAMENTAL (PS), REAR (UX)	
* 129	3-965-406-21	PLATE, ORNAMENTAL (PS), REAR (B)	
* 129	3-965-406-31	PLATE, ORNAMENTAL (PS), REAR (NP)	
* 129	3-965-406-41	PLATE, ORNAMENTAL (PS), REAR (AS)	
* 129	3-965-406-51	PLATE, ORNAMENTAL (PS), REAR (NZ)	
* 130	3-965-397-01	PLATE, ORNAMENTAL (IO), REAR (VC)	
* 130	3-965-397-11	PLATE, ORNAMENTAL (IO), REAR (B)	
* 130	3-965-397-21	PLATE, ORNAMENTAL (IO), REAR (UX)	
* 130	3-965-397-31	PLATE, ORNAMENTAL (IO), REAR (NP)	
* 130	3-965-397-41	PLATE, ORNAMENTAL (IO), REAR (AS)	
* 130	3-965-397-51	PLATE, ORNAMENTAL (IO), REAR (NZ)	
131	3-703-397-01	STOPPER, WIRING	
CP101	1-468-042-11	POWER BLOCK (AS, B, NP, NZ, VC)	
CP101	1-468-043-11	POWER BLOCK (UX)	
⚠CJ101	1-251-134-11	INLET, AC (250V/2.5A)	
D001	8-719-048-26	DIODE GL528V1 (TAPE TOP/END)	
⚠F101	1-576-228-11	FUSE (H.B.C) (250V/2A)	
FH101	1-533-293-11	FUSE HOLDER	
FH102	1-533-293-11	FUSE HOLDER	
IC141	8-759-189-48	IC PQ12RE11	
LC151	1-810-948-11	DISPLAY PANEL, LIQUID CRYSTAL	
P701	1-555-110-00	CABLE, PIN	
Q001	8-729-025-92	PHOTO TRANSISTOR PT380F (TAPE TOP)	
Q002	8-729-025-92	PHOTO TRANSISTOR PT380F (TAPE END)	

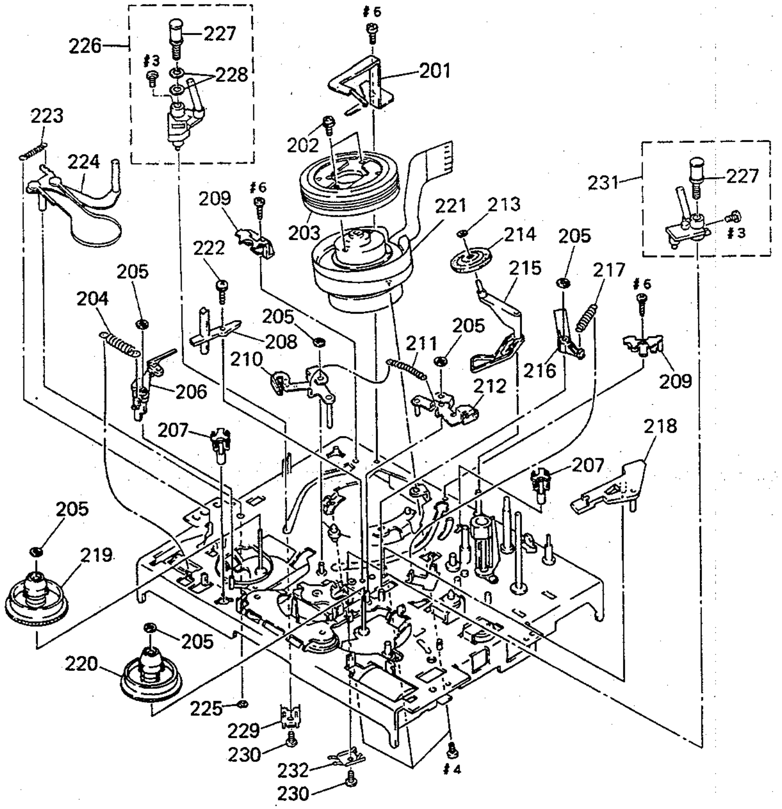
5-1-4. MECHANICAL DECK ASSEMBLY (1)


151
154
#6
155
152
153
169
not supplied
166
164
165
160
156
161
167
#7
171
179
not supplied
162
#6
163
168
159
158
157
173
172
174
175
176
177
178
170

Ref. No.	Part No.	Description	Remark
151	A-6751-496-A	FL BLOCK ASSY	
152	3-958-467-01	SPRING, TENSION COIL	
153	3-958-195-01	SPRING, TORSION	
154	3-960-215-01	PLATE, LIGHT GUIDE, END SENSOR	
155	3-960-216-01	PLATE, LIGHT GUIDE, TOP SENSOR	
156	X-3944-460-1	ROLLER ASSY, TG2	
157	3-958-487-01	SPRING, (AEC) TORSION COIL	
158	1-500-144-11	HEAD, FE	
159	3-959-841-03	HOLDER, FEH	
160	3-962-298-01	BRACKET, TG7 TAPE	
161	X-3944-797-1	TG8 ASSY	
162	3-958-421-01	HOLDER, TG8	
163	3-958-152-01	GEAR, TG8	
164	A-6736-103-A	ACE BLOCK ASSY (INCLUDING AC-101 BOARD)	
165	1-506-485-11	PIN, CONNECTOR 6P	

Ref. No.	Part No.	Description	Remark
166	3-960-439-02	SPRING (ACE), COMPRESSION	
167	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
168	3-958-491-02	BASE, ACE	
169	A-6746-072-A	PRESS BLOCK ASSY, PINCH	
170	3-958-505-01	SPRING (SOFT BRAKE T), TENSION	
171	3-958-455-01	SPRING (PINCH), TENSION	
172	3-958-151-01	GEAR, ELEVATOR	
173	3-958-454-01	OPNER, LID	
174	3-958-501-01	SCREW, ACE ADJUSTMENT	
175	3-958-153-01	GEAR, PRESS	
176	3-958-462-01	SPRING (RVS BRAKE), TENSION	
177	X-3943-885-1	ARM ASSY, RVS BRAKE	
178	X-3943-882-1	BRAKE (T) ASSY, SOFT	
179	3-701-438-11	WASHER, 2.5	

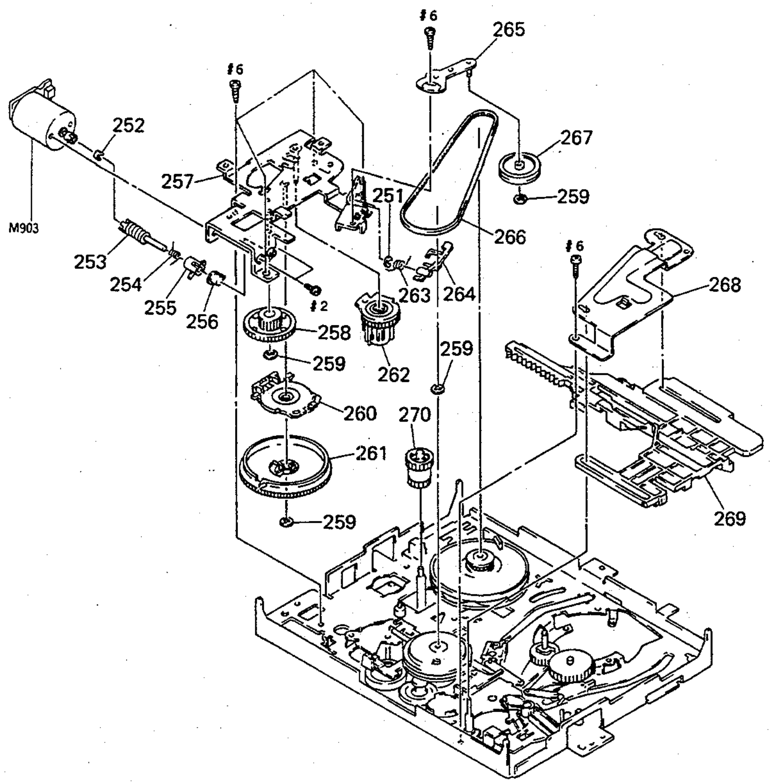
5-1-5. MECHANICAL DECK ASSEMBLY (2)


226
227
#3
228
#6
201
223
202
224
209
#6
203
221
213
231
227
214
205
222
215
217
#3
205
204
205
#6
208
211
205
210
216
209
206
212
207
218
207
205
219
205
220
225
229
230
232
230
#4

Ref. No.	Part No.	Description	Remark
201	X-3943-899-5	GROUND ASSY, SHAFT	
202	3-643-205-01	SCREW (PSW) 3X8	
203	8-848-623-01	DRUM ASSY, ROTARY UPPER (DZR-67-R)	
204	3-958-443-01	SPRING, STRETCH COIL SPRING	
205	3-669-595-00	WASHER (2), STOPPER	
206	3-958-450-01	BRAKE (S), SOFT	
207	3-958-390-01	SHAFT, PC BOARD	
208	3-958-391-01	PLATE, LIGHT GUIDE, LED	
209	3-958-389-01	CATCHER	
210	X-3945-443-1	BRAKE (S) ASSY, MAIN	
211	3-958-517-01	SPRING, TENSIONCOIL	
212	X-3945-444-1	BRAKE (T) ASSY, MAIN	
213	3-321-393-01	WASHER, STOPPER	
214	X-3944-363-1	ROLLER ASSY, HC	
215	X-3943-896-1	ARM ASSY, HC	
216	3-960-139-01	ARM, NEUTRALITY	

Ref. No.	Part No.	Description	Remark
217	3-958-535-01	SPRING, TENSION	
218	3-960-138-01	ARM, PENDULUM COMPULSION	
219	X-3943-902-1	TABLE, REEL (S) ASSY	
220	X-3943-903-1	TABLE, REEL (T) ASSY	
221	8-848-639-01	DRUM ASSY, ROTARY LOWER (DZL-51-R)	
222	3-961-441-01	SCREW (3X8)	
223	3-958-492-01	SPRING (TG1), TENSION COIL	
224	X-3943-886-1	TG1 ASSY	
225	3-669-595-00	WASHER (2), STOPPER	
226	A-6750-316-A	SHUTTLE (S) BLOCK ASSY	
227	X-3944-378-1	ROLLER ASSY, GUIDE	
228	3-962-874-01	O-RING	
229	3-960-687-01	SPRING, LEAF (S), LOADING	
230	3-960-720-01	SCREW	
231	A-6750-314-A	T BLOCK ASSY, SHUTTLE	
232	3-960-688-01	SPRING, LEAF (T), LOADING	

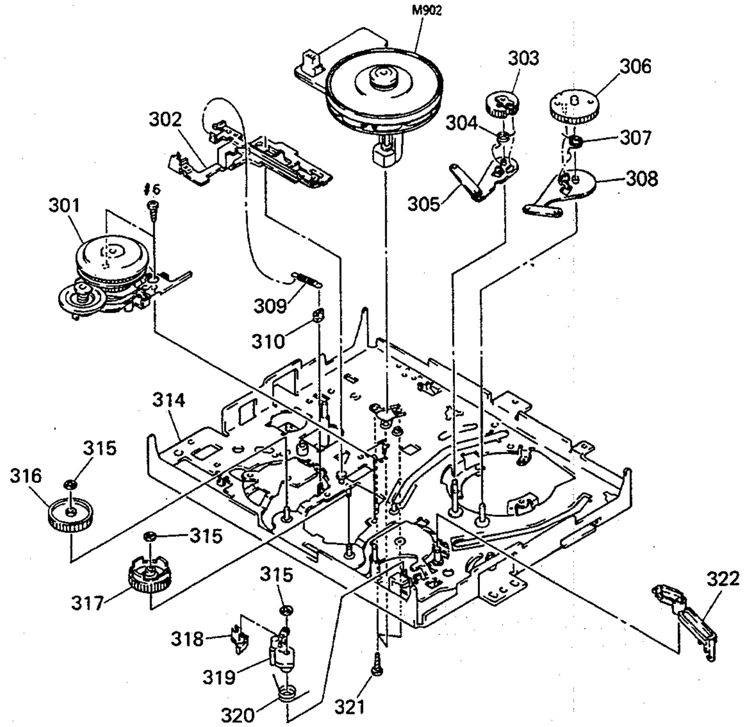
5-1-6. MECHANICAL DECK ASSEMBLY (3)


#6
265
#6
252
257
M903
251
267
259
266
253
254
255
256
#2
258
263
264
#6
268
259
262
259
260
270
261
269
259

Ref. No.	Part No.	Description	Remark
251	3-701-439-21	WASHER	
252	3-959-840-11	RUBBER, JOINT	
253	3-958-159-01	WORM	
254	3-958-460-01	SPRING, ONE-WAY	
255	3-958-160-01	PROPELLOR	
256	3-958-155-01	BEARING, CAM MOTOR	
* 257	X-3943-884-1	CHASSIS ASSY, CAM MOTOR	
258	3-958-157-01	WHEEL, WORM	
259	3-669-595-00	WASHER (2), STOPPER	
260	1-762-076-11	SWITCH, ROTARY	
261	3-958-161-01	GEAR, CAM	

Ref. No.	Part No.	Description	Remark
262	3-958-156-01	GEAR, FL DRIVING	
263	3-958-445-01	SPRING, TORSIONCOIL (CAP BRAKE)	
264	X-3943-888-1	BRAKE ASSY, CAP	
265	X-3943-889-1	ARM ASSY, TENSION VEHICLE	
266	3-958-361-01	BELT, TIMING	
267	3-958-448-01	WHEEL, TENSION	
* 268	3-959-763-01	RETAINER	
269	3-958-163-01	SLIDER, MAIN	
270	3-958-162-01	GEAR, UPPER/LOWER COMMUNICATION	
M903	X-3943-883-1	MOTOR ASSY, CAM	

5-1-7. MECHANICAL CHASSIS ASSEMBLY (4)


M902
303
306
302
304
307
308
301
#6
305
309
310
314
315
316
315
322
315
317
318
319
320
321

Ref. No.	Part No.	Description	Remark
301	A-6739-102-A	RKB BLOCK ASSY	
302	X-3943-897-1	LEVER ASSY, TRIGGER	
303	3-958-485-01	GEAR (T), LOADING	
304	3-960-449-01	SPRING (T), TORSION COIL	
305	X-3943-891-1	LEVER (T) ASSY, LOADING	
306	3-958-476-01	GEAR (S), LOADING	
307	3-960-448-01	SPRING (S), TORSION COIL	
308	X-3943-890-1	LEVER (S) ASSY, LOADING	
309	3-958-529-01	SPRING (MOMENT), TENSION	
310	3-959-840-01	RUBBER, JOINT	

Ref. No.	Part No.	Description	Remark
314	X-3943-874-1	CHASSIS ASSY, MECHANICAL	
316	3-962-960-01	GEAR (T-K), IDLER	
317	3-962-959-01	GEAR (S-K), IDLER	
318	3-958-533-01	CLAW, S WINDING	
319	3-958-532-01	ARM, S WINDING	
320	3-958-534-01	SPRING, TORSION	
321	3-960-272-01	SCREW (2.6)	
322	3-958-504-01	ARM, FIXED RELEASE	
M902	1-698-409-11	MOTOR, DC (CAPSTAN)	

5-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark
*	A-6782-675-A	CN-92 BOARD, COMPLETE **********************	
			(Ref. No. 5,000 series)
		< CAPACITOR >	
C202	1-126-964-11	ELECT 10uF	20% 50V
		< JACK >	
CJ201	1-565-726-11	JACK, PIN 3P (LINE IN 4)	
		< CONNECTOR >	
CN201	1-506-483-21	PIN, CONNECTOR 4P	
CN202	1-564-013-21	PIN, CONNECTOR 3P	
		< DIODE >	
D201	8-719-109-97	DIODE RD6.8ES-B2	
D202	8-719-109-97	DIODE RD6.8ES-B2	
D203	8-719-109-97	DIODE RD6.8ES-B2	
D204	8-719-109-97	DIODE RD6.8ES-B2	
D205	8-719-109-97	DIODE RD6.8ES-B2	
D206	8-719-109-97	DIODE RD6.8ES-B2	
D207	8-719-109-97	DIODE RD6.8ES-B2	
		< FILTER >	
FL201	1-236-163-11	ENCAPSULATED COMPONENT	
FL202	1-236-163-11	ENCAPSULATED COMPONENT	
		< RESISTOR >	
R201	1-216-041-00	METAL CHIP 470	5% 1/10W
R202	1-216-041-00	METAL CHIP 470	5% 1/10W
R203	1-216-022-00	METAL CHIP 75	5% 1/10W
R204	1-216-025-91	METAL GLAZE 100	5% 1/10W
R205	1-216-025-91	METAL GLAZE 100	5% 1/10W

Ref. No.	Part No.	Description	Remark
*	A-6782-679-A	CP-71 BOARD, COMPLETE (AS, B, NP, NZ, VC)	
*	A-6782-687-A	CP-71 BOARD, COMPLETE (UX) **********************	
			(Ref. No. 5,000 series)
		< CAPACITOR >	
C701	1-163-031-11	CERAMIC CHIP 0.01uF	50V (AS, B, NP, NZ, VC)
C702	1-126-967-11	ELECT 47uF	20% 16V (AS, B, NP, NZ, VC)
C703	1-107-682-11	CERAMIC CHIP 1uF	10% 16V (AS, B, NP, NZ, VC)
C704	1-126-301-11	ELECT 1uF	20% 50V (AS, B, NP, NZ, VC)
C705	1-126-301-11	ELECT 1uF	20% 50V (AS, B, NP, NZ, VC)
C706	1-126-301-11	ELECT 1uF	20% 50V (AS, B, NP, NZ, VC)
C751	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C752	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C756	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C757	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C758	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C759	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C760	1-163-031-11	CERAMIC CHIP 0.01uF	50V (AS, B, NP, NZ, VC)
C761	1-126-967-11	ELECT 47uF	20% 16V (AS, B, NP, NZ, VC)
C762	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C763	1-124-234-00	ELECT 22uF	20% 16V (AS, B, NP, NZ, VC)
C764	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C765	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C766	1-124-234-00	ELECT 22uF	20% 16V (AS, B, NP, NZ, VC)
C767	1-124-234-00	ELECT 22uF	20% 16V (AS, B, NP, NZ, VC)
C768	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C769	1-128-551-11	ELECT 22uF	20% 25V (AS, B, NP, NZ, VC)
C802	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C803	1-124-234-00	ELECT 22uF	20% 16V
C805	1-126-964-11	ELECT 10uF	20% 50V
C806	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C808	1-102-074-00	CERAMIC 0.001uF	10% 50V
C851	1-126-964-11	ELECT 10uF	20% 50V
C852	1-124-925-11	ELECT 2.2uF	20% 100V
C854	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C856	1-124-925-11	ELECT 2.2uF	20% 100V
C891	1-126-967-11	ELECT 47uF	20% 16V (AS, B, NP, NZ, VC)
C892	1-164-336-11	CERAMIC CHIP 0.33uF	25V (AS, B, NP, NZ, VC)
		< CONNECTOR >	
CJ775	1-695-935-11	CONNECTOR (SQUARE TYPE) 21P	(PAY-TV DECODER)
CJ801	1-695-935-11	CONNECTOR (SQUARE TYPE) 21P	(EURO-AV (LINE IN 2))
		< CONNECTOR >	
CN701	1-506-479-11	PIN, CONNECTOR 14P	(AS, B, NP, NZ, VC)
CN702	1-564-002-11	PIN, CONNECTOR 3P	(AS, B, NP, NZ, VC)
CN751	1-766-988-71	CONNECTOR, FFC/FPC 15P	(AS, B, NP, NZ, VC)
CN801	1-564-002-41	PIN, CONNECTOR 3P	
CN802	1-506-468-11	PIN, CONNECTOR 3P	
CN803	1-506-469-11	PIN, CONNECTOR 4P	
CN851	1-506-468-11	PIN, CONNECTOR 3P	
CN852	1-691-043-21	HOUSING, CONNECTOR 11P	
CN853	1-506-469-11	PIN, CONNECTOR 4P	
		< DIODE >	
D701	8-719-914-42	DIODE DA204K	(AS, B, NP, NZ, VC)
D775	8-719-016-73	DIODE STZ6.8T	(AS, B, NP, NZ, VC)
D777	8-719-016-73	DIODE STZ6.8T	(AS, B, NP, NZ, VC)
D779	8-719-016-73	DIODE STZ6.8T	(AS, B, NP, NZ, VC)
D782	8-719-016-73	DIODE STZ6.8T	(AS, B, NP, NZ, VC)
D783	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D784	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D785	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D786	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D787	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D788	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D789	8-719-921-86	DIODE MTZJ-13	(AS, B, NP, NZ, VC)
D790	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D791	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D792	8-719-016-73	DIODE STZ6.8T	(AS, B, NP, NZ, VC)
D794	8-719-109-97	DIODE RD6.8ES-B2	(AS, B, NP, NZ, VC)
D801	8-719-109-97	DIODE RD6.8ES-B2	
D802	8-719-109-97	DIODE RD6.8ES-B2	
D803	8-719-109-97	DIODE RD6.8ES-B2	
D804	8-719-109-97	DIODE RD6.8ES-B2	
D805	8-719-109-97	DIODE RD6.8ES-B2	
D806	8-719-109-97	DIODE RD6.8ES-B2	
D807	8-719-109-97	DIODE RD6.8ES-B2	
D851	8-719-914-42	DIODE DA204K	
D852	8-719-914-42	DIODE DA204K	
D853	8-719-903-61	DIODE SLP361B	
		< FILTER >	
FL775	1-236-163-11	ENCAPSULATED COMPONENT	(AS, B, NP, NZ, VC)
FL776	1-236-163-11	ENCAPSULATED COMPONENT	(AS, B, NP, NZ, VC)
FL777	1-236-163-11	ENCAPSULATED COMPONENT	(AS, B, NP, NZ, VC)
FL778	1-236-163-11	ENCAPSULATED COMPONENT	(AS, B, NP, NZ, VC)
FL801	1-236-163-11	ENCAPSULATED COMPONENT	
FL802	1-236-163-11	ENCAPSULATED COMPONENT	
		< IC >	
IC701	8-759-280-24	IC BA7630F-E2	(AS, B, NP, NZ, VC)
IC751	8-759-280-23	IC BA7632F-E2	(AS, B, NP, NZ, VC)
IC752	8-759-280-23	IC BA7632F-E2	(AS, B, NP, NZ, VC)
IC801	8-759-084-76	IC MM1111XF	
IC802	8-759-909-71	IC BA4558F	
IC803	8-759-009-06	IC MC14052BF	
IC851	8-759-349-19	IC NJM3414AM-TE2	
IC852	8-759-909-71	IC BA4558F	
IC891	8-759-296-72	IC PQ12SZ5U	(AS, B, NP, NZ, VC)
		< COIL >	
L801	1-410-517-11	INDUCTOR 47uH	
L891	1-410-517-11	INDUCTOR 47uH	
		< LEAD PIN >	
LP701	4-352-844-01	PIN, LEAD, COATING (UX)	
		< TRANSISTOR >	
Q701	8-729-120-28	TRANSISTOR 2SC1623-L5L6	(AS, B, NP, NZ, VC)
Q702	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	(AS, B, NP, NZ, VC)
Q703	8-729-120-28	TRANSISTOR 2SC1623-L5L6	(AS, B, NP, NZ, VC)

Ref. No.	Part No.	Description			Remark
Q704	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR		(AS, B, NP, NZ, VC)
Q851	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q852	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR		

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R701	1-208-766-11	METAL GLAZE	220	0.50%	1/10W (AS, B, NP, NZ, VC)
R702	1-208-766-11	METAL GLAZE	220	0.50%	1/10W (AS, B, NP, NZ, VC)
R703	1-216-025-91	METAL GLAZE	100	5%	1/10W (AS, B, NP, NZ, VC)
R704	1-216-049-91	METAL GLAZE	1K	5%	1/10W (AS, B, NP, NZ, VC)
R705	1-216-073-00	METAL CHIP	10K	5%	1/10W (AS, B, NP, NZ, VC)
R706	1-216-073-00	METAL CHIP	10K	5%	1/10W (AS, B, NP, NZ, VC)
R707	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W (AS, B, NP, NZ, VC)
R708	1-216-073-00	METAL CHIP	10K	5%	1/10W (AS, B, NP, NZ, VC)
R709	1-216-049-91	METAL GLAZE	1K	5%	1/10W (AS, B, NP, NZ, VC)
R710	1-216-073-00	METAL CHIP	10K	5%	1/10W (AS, B, NP, NZ, VC)
R711	1-216-022-00	METAL CHIP	75	5%	1/10W (AS, B, NP, NZ, VC)
R751	1-216-025-91	METAL GLAZE	100	5%	1/10W (AS, B, NP, NZ, VC)
R752	1-216-025-91	METAL GLAZE	100	5%	1/10W (AS, B, NP, NZ, VC)
R753	1-216-025-91	METAL GLAZE	100	5%	1/10W (AS, B, NP, NZ, VC)
R754	1-216-025-91	METAL GLAZE	100	5%	1/10W (AS, B, NP, NZ, VC)
R775	1-216-089-91	METAL GLAZE	47K	5%	1/10W (AS, B, NP, NZ, VC)
R776	1-216-089-91	METAL GLAZE	47K	5%	1/10W (AS, B, NP, NZ, VC)
R777	1-216-043-91	METAL GLAZE	560	5%	1/10W (AS, B, NP, NZ, VC)
R778	1-216-041-00	METAL CHIP	470	5%	1/10W (AS, B, NP, NZ, VC)
R779	1-216-043-91	METAL GLAZE	560	5%	1/10W (AS, B, NP, NZ, VC)
R780	1-216-041-00	METAL CHIP	470	5%	1/10W (AS, B, NP, NZ, VC)
R781	1-216-022-00	METAL CHIP	75	5%	1/10W (AS, B, NP, NZ, VC)
R802	1-216-017-91	METAL GLAZE	47	5%	1/10W
R803	1-216-017-91	METAL GLAZE	47	5%	1/10W
R804	1-216-022-00	METAL CHIP	75	5%	1/10W
R805	1-216-025-91	METAL GLAZE	100	5%	1/10W
R806	1-216-041-00	METAL CHIP	470	5%	1/10W
R807	1-216-025-91	METAL GLAZE	100	5%	1/10W
R808	1-216-041-00	METAL CHIP	470	5%	1/10W
R809	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R810	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R811	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R812	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R813	1-215-455-00	METAL	27K	1%	1/6W
R814	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R815	1-215-455-00	METAL	27K	1%	1/6W
R816	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R852	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R854	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R855	1-216-196-00	METAL GLAZE	820	5%	1/8W
R856	1-216-230-00	METAL GLAZE	22K	5%	1/8W
R857	1-216-099-00	METAL CHIP	120K	5%	1/10W
R858	1-216-081-00	METAL CHIP	22K	5%	1/10W
R859	1-216-295-91	CONDUCTOR, CHIP	(2012)		
R861	1-216-295-91	CONDUCTOR, CHIP	(2012)		
R862	1-216-081-00	METAL CHIP	22K	5%	1/10W
R863	1-216-099-00	METAL CHIP	120K	5%	1/10W
R865	1-216-081-00	METAL CHIP	22K	5%	1/10W
R866	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R867	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R868	1-216-049-91	METAL GLAZE	1K	5%	1/10W

* A-6794-089-A DC-66 BOARD, COMPLETE

****

(Ref. No. 4,000 series)

< CONNECTOR >

Ref. No.	Part No.	Description
* CN501	1-766-714-11	CONNECTOR, BOARD TO BOARD 5P
* CN502	1-766-713-11	CONNECTOR, BOARD TO BOARD 5P

* A-6721-595-A HF-34 BOARD, COMPLETE

****

(Ref. No. 4,000 series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C101	1-124-907-11	ELECT	10uF	20%	50V
C102	1-124-907-11	ELECT	10uF	20%	50V
C103	1-126-963-11	ELECT	4.7uF	20%	50V
C104	1-126-963-11	ELECT	4.7uF	20%	50V
C105	1-104-664-11	ELECT	47uF	20%	10V
C106	1-104-664-11	ELECT	47uF	20%	10V
C107	1-104-664-11	ELECT	47uF	20%	10V
C108	1-126-962-11	ELECT	3.3uF	20%	50V
C109	1-126-962-11	ELECT	3.3uF	20%	50V
C110	1-126-962-11	ELECT	3.3uF	20%	50V
C111	1-126-962-11	ELECT	3.3uF	20%	50V
C112	1-126-233-11	ELECT	22uF	20%	50V
C113	1-126-233-11	ELECT	22uF	20%	50V
C114	1-124-252-00	ELECT	0.33uF	20%	50V
C115	1-124-443-00	ELECT	100uF	20%	10V
C116	1-124-443-00	ELECT	100uF	20%	10V
C117	1-104-663-11	ELECT	33uF	20%	16V
C118	1-137-372-11	FILM	0.022uF	5%	50V
C119	1-137-372-11	FILM	0.022uF	5%	50V
C120	1-137-370-11	FILM	0.01uF	5%	50V
C121	1-137-370-11	FILM	0.01uF	5%	50V
C122	1-137-367-11	FILM	0.0033uF	5%	50V
C123	1-137-367-11	FILM	0.0033uF	5%	50V
C124	1-137-364-11	FILM	0.001uF	5%	50V
C125	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C126	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C127	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C128	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C129	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C130	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C131	1-137-372-11	FILM	0.022uF	5%	50V
C132	1-137-372-11	FILM	0.022uF	5%	50V
C133	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C134	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

Ref. No.	Part No.	Description
* CN101	1-573-825-11	CONNECTOR, BOARD TO BOARD 11P
* CN102	1-573-825-11	CONNECTOR, BOARD TO BOARD 11P
* CN103	1-564-013-11	PIN, CONNECTOR 3P

< DIODE >

Ref. No.	Part No.	Description	
D101	8-719-404-46	DIODE	MA110

< IC >

Ref. No.	Part No.	Description	
IC101	8-759-188-81	IC	XLH7776K-VP

< TRANSISTOR >

Ref. No.	Part No.	Description	
Q101	8-729-804-41	TRANSISTOR	2SB1122-S
Q102	8-729-820-68	TRANSISTOR	2SD1802FA-S
Q103	8-729-421-19	TRANSISTOR	UN2213
Q104	8-729-421-19	TRANSISTOR	UN2213

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R101	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W
R102	1-208-809-11	METAL GLAZE	13K	0.50%	1/10W
R103	1-216-083-00	METAL CHIP	27K	5%	1/10W
R104	1-216-081-00	METAL CHIP	22K	5%	1/10W
R105	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R106	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R107	1-216-083-00	METAL CHIP	27K	5%	1/10W
R108	1-216-075-00	METAL CHIP	12K	5%	1/10W
R109	1-216-075-00	METAL CHIP	12K	5%	1/10W
R110	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R111	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R112	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R113	1-216-109-00	METAL CHIP	330K	5%	1/10W
R114	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R115	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R116	1-216-077-00	METAL CHIP	15K	5%	1/10W
R118	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R119	1-216-107-00	METAL CHIP	270K	5%	1/10W
R120	1-216-295-91	CONDUCTOR, CHIP	(2012)		
R121	1-216-107-00	METAL CHIP	270K	5%	1/10W
R123	1-216-295-91	CONDUCTOR, CHIP	(2012)		
R124	1-216-066-00	METAL CHIP	5.1K	5%	1/10W
R125	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R130	1-216-049-91	METAL GLAZE	1K	5%	1/10W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV101	1-241-764-11	RES, ADJ, CERMET 10K
RV102	1-241-763-11	RES, ADJ, CERMET 4.7K
RV103	1-241-763-11	RES, ADJ, CERMET 4.7K

* A-6782-681-A MA-241 BOARD, COMPLETE (AS, VC)
* A-6782-688-A MA-241 BOARD, COMPLETE (UX)
* A-6782-690-A MA-241 BOARD, COMPLETE (B)
* A-6782-692-A MA-241 BOARD, COMPLETE (NP, NZ)

****

(Ref. No. 1,000 series)

Ref. No.	Part No.	Description
	1-954-839-11	HARNESS (IO-66)
	3-831-441-XX	CUSHION, SPEAKER
*	3-960-273-01	SPACER, TOP END
*	3-960-274-01	SPACER, LED

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C001	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C002	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C003	1-126-096-11	ELECT	10uF	20%	35V
C004	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C006	1-124-589-11	ELECT	47uF	20%	16V
C007	1-124-635-00	ELECT	220uF	20%	6.3V
C008	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C009	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C025	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V

Ref. No.	Part No.	Description			Remark
C026	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C071	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C072	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C073	1-124-455-00	ELECT	100uF	20%	16V
C074	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C075	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C076	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C077	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C078	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C079	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C101	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C102	1-124-589-11	ELECT	47uF	20%	16V
C103	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C104	1-124-248-00	ELECT	22uF	20%	35V
C105	1-124-584-00	ELECT	100uF	20%	10V
C106	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-124-257-00	ELECT	2.2uF	20%	50V
C110	1-126-967-11	ELECT	47uF	20%	16V
C111	1-124-257-00	ELECT	2.2uF	20%	50V
C210	1-124-584-00	ELECT	100uF	20%	10V
C211	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C212	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C213	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C214	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C254	1-130-489-00	MYLAR	0.033uF	5%	50V
C255	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C256	1-124-248-00	ELECT	22uF	20%	35V
C257	1-137-441-11	FILM	0.027uF	5%	50V
C258	1-124-261-00	ELECT	10uF	20%	50V
C271	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C272	1-124-589-11	ELECT	47uF	20%	16V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C352	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C353	1-124-464-11	ELECT	0.22uF	20%	50V
C354	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C361	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C362	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C401	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C402	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C404	1-163-239-11	CERAMIC CHIP	33PF	5%	50V (B)
C405	1-163-107-00	CERAMIC CHIP	39PF	5%	50V (B)
C406	1-126-785-11	ELECT	47uF	20%	10V
C407	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C408	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C409	1-126-785-11	ELECT	47uF	20%	10V
C410	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C411	1-163-235-11	CERAMIC CHIP	22PF	5%	50V

Ref. No.	Part No.	Description			Remark
C412	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C413	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C416	1-124-257-00	ELECT	2.2uF	20%	50V
C417	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C418	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C419	1-126-785-11	ELECT	47uF	20%	10V
C420	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C421	1-162-306-11	CERAMIC	0.01uF	20%	16V
C422	1-126-160-11	ELECT	1uF	20%	50V
C423	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C424	1-126-785-11	ELECT	47uF	20%	10V
C425	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C427	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C501	1-126-096-11	ELECT	10uF	20%	35V
C502	1-126-096-11	ELECT	10uF	20%	35V
C503	1-124-261-00	ELECT	10uF	20%	50V
C504	1-126-967-11	ELECT	47uF	20%	10V
C505	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C506	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C507	1-126-967-11	ELECT	47uF	20%	10V
C508	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C509	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C510	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C511	1-124-589-11	ELECT	47uF	20%	16V
C512	1-124-635-00	ELECT	220uF	20%	6.3V
C513	1-126-935-11	ELECT	470uF	20%	6.3V
C514	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C515	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C516	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C517	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C518	1-126-964-11	ELECT	10uF	20%	50V
C519	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C520	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C521	1-126-935-11	ELECT	470uF	20%	6.3V
C703	1-124-261-00	ELECT	10uF	20%	50V
C704	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C705	1-124-261-00	ELECT	10uF	20%	50V
C706	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C707	1-124-589-11	ELECT	47uF	20%	16V
C708	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C710	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C711	1-126-933-11	ELECT	100uF	20%	16V
C712	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C713	1-126-967-11	ELECT	47uF	20%	10V
C714	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C715	1-126-785-11	ELECT	47uF	20%	10V
C716	1-124-261-00	ELECT	10uF	20%	50V
C717	1-124-261-00	ELECT	10uF	20%	50V
C718	1-124-248-00	ELECT	22uF	20%	35V

Ref. No.	Part No.	Description			Remark
C721	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C723	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C727	1-124-589-11	ELECT	47uF	20%	16V
C852	1-164-159-21	CERAMIC	0.1uF		50V
C853	1-164-159-21	CERAMIC	0.1uF		50V
C854	1-124-261-00	ELECT	10uF	20%	50V
C855	1-164-159-21	CERAMIC	0.1uF		50V
C856	1-137-370-11	FILM	0.01uF	5%	50V
C857	1-126-163-11	ELECT	4.7uF	20%	50V
C858	1-126-162-11	ELECT	3.3uF	20%	50V
C859	1-163-014-00	CERAMIC CHIP	0.0027uF	5%	50V
C860	1-163-143-00	CERAMIC CHIP	0.0012uF	5%	50V
C861	1-124-257-00	ELECT	2.2uF	20%	50V
C862	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C863	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C864	1-124-248-00	ELECT	22uF	20%	35V
C865	1-124-248-00	ELECT	22uF	20%	35V
C866	1-124-252-00	ELECT	0.33uF	20%	50V
C867	1-124-261-00	ELECT	10uF	20%	50V
C881	1-137-612-11	FILM	0.0068uF	5%	100V
C882	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C883	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C884	1-126-933-11	ELECT	100uF	20%	16V
C885	1-126-785-11	ELECT	47uF	20%	10V
C889	1-137-453-11	FILM	560PF	5%	100V
C891	1-104-697-11	FILM	0.047uF	5%	100V
C892	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C893	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C894	1-126-933-11	ELECT	100uF	20%	16V
C901	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C903	1-124-584-00	ELECT	100uF	20%	10V
C904	1-164-159-21	CERAMIC	0.1uF		50V
C905	1-126-916-11	ELECT	1000uF	20%	6.3V
C906	1-126-916-11	ELECT	1000uF	20%	6.3V

< JACK >

Ref. No.	Part No.	Description
CJ501	1-568-016-11	SOCKET, PIN 21P (EURO-AV (LINE 1))
CJ502	1-565-351-41	JACK, PIN 3P (LINE OUT 2)

< CONNECTOR >

Ref. No.	Part No.	Description
* CN051	1-766-537-11	CONNECTOR (HMD) 5P
* CN071	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P
CN101	1-506-468-11	PIN, CONNECTOR 3P
CN201	1-506-468-11	PIN, CONNECTOR 3P
CN501	1-564-002-41	PIN, CONNECTOR 3P
CN502	1-506-479-11	PIN, CONNECTOR 14P (AS, B, NP, NZ, VC)
CN503	1-766-988-71	CONNECTOR, FFC/FPC 15P (AS, B, NP, NZ, VC)
CN504	1-766-984-41	CONNECTOR, FFC/FPC 11P
CN881	1-506-469-11	PIN, CONNECTOR 4P
* CN882	1-560-891-00	PIN, CONNECTOR 3P
CN883	1-564-002-11	PIN, CONNECTOR 3P
* CN901	1-573-843-11	CONNECTOR, BOARD TO BOARD 11P
* CN902	1-573-843-11	CONNECTOR, BOARD TO BOARD 11P
* CN903	1-766-715-11	CONNECTOR, BOARD TO BOARD 10P
CN904	1-766-992-11	CONNECTOR, FFC/FPC 19P
CN905	1-766-992-11	CONNECTOR, FFC/FPC 19P
CN907	1-573-852-11	CONNECTOR, BOARD TO BOARD 20P
CN908	1-573-846-11	CONNECTOR, BOARD TO BOARD 14P
* CN909	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P
CN910	1-770-017-11	CONNECTOR, BOARD TO BOARD 19P
* CN912	1-766-717-11	CONNECTOR, BOARD TO BOARD 5P

< DIODE >

Ref. No.	Part No.	Description	
D001	8-719-048-26	LED	GL528V1 (TOP/END)
D006	8-719-921-54	DIODE	MTZJ-6.2B
D007	8-719-921-54	DIODE	MTZJ-6.2B
D071	8-719-110-14	DIODE	RD9.1ES-B3
D206	8-719-989-26	DIODE	DAN212K
D251	8-719-989-26	DIODE	DAN212K
D252	8-719-101-50	DIODE	RD5.1E-L2
D253	8-719-101-47	DIODE	RD4.7E-L2
D401	8-719-914-43	DIODE	DAN202K (B)
D402	8-719-989-26	DIODE	DAN212K
D501	8-719-109-97	DIODE	RD6.8ES-B2
D502	8-719-109-97	DIODE	RD6.8ES-B2
D503	8-719-109-97	DIODE	RD6.8ES-B2
D504	8-719-109-97	DIODE	RD6.8ES-B2
D505	8-719-109-97	DIODE	RD6.8ES-B2
D506	8-719-921-86	DIODE	MTZJ-13
D507	8-719-982-09	DIODE	MTZJ-4.3
D508	8-719-108-12	DIODE	RD9.1E-W
D509	8-719-108-12	DIODE	RD9.1E-W
D510	8-719-108-12	DIODE	RD9.1E-W
D511	8-719-108-12	DIODE	RD9.1E-W
D512	8-719-109-97	DIODE	RD6.8ES-B2
D513	8-719-109-97	DIODE	RD6.8ES-B2
D514	8-719-109-97	DIODE	RD6.8ES-B2
D515	8-719-109-97	DIODE	RD6.8ES-B2
D516	8-719-200-82	DIODE	11ES2
D517	8-719-914-42	DIODE	DA204K
D518	8-719-914-43	DIODE	DAN202K
D519	8-719-914-43	DIODE	DAN202K
D520	8-719-108-12	DIODE	RD9.1E-W
D521	8-719-108-12	DIODE	RD9.1E-W
D522	8-719-108-12	DIODE	RD9.1E-W
D523	8-719-108-12	DIODE	RD9.1E-W
D702	8-719-914-42	DIODE	DA204K
D703	8-719-978-94	DIODE	DTZ-TT11-30C

Ref. No.	Part No.	Description	Remark
D708	8-719-989-26	DIODE DAN212K	
D709	8-719-109-85	DIODE RD5.1ES-B2	
D710	8-719-911-19	DIODE 1SS119-25	
D901	8-719-989-26	DIODE DAN212K	
D902	8-719-200-82	DIODE 11ES2	
D903	8-719-200-82	DIODE 11ES2	

< FILTER >

Ref. No.	Part No.	Description	Remark
FL501	1-236-163-11	ENCAPSULATED COMPONENT	
FL502	1-236-163-11	ENCAPSULATED COMPONENT	
FL503	1-236-163-11	ENCAPSULATED COMPONENT	
FL504	1-236-163-11	ENCAPSULATED COMPONENT	
FL505	1-236-163-11	ENCAPSULATED COMPONENT	
FL506	1-236-163-11	ENCAPSULATED COMPONENT	

< IC >

Ref. No.	Part No.	Description	Remark
IC002	8-759-100-95	IC uPC324G2	
IC071	8-759-294-26	IC BA6209-V2	
IC101	8-759-246-14	IC TA8823N	
IC201	8-752-868-75	IC CXP87248-096Q	
IC251	8-759-702-02	IC NJM062M	
IC351	8-759-097-80	IC HD49783FP	
IC401	8-759-349-14	IC MB90089PF-G-135-BND-ER	
IC402	8-759-164-09	IC LA7218M	
IC501	8-759-189-85	IC BA7645N	
IC502	8-759-009-06	IC MC14052BF	
IC503	8-759-924-46	IC BA4560F	
IC504	8-759-009-06	IC MC14052BF	
IC505	8-759-349-35	IC BA7623F-E2	
IC851	8-759-268-02	IC BA7796FS-E2	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remark
JR010	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR012	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR014	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR015	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR016	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR017	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR104	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR361	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR362	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR363	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR515	1-216-295-91	CONDUCTOR, CHIP (2012) (UX)	
JR516	1-216-296-91	CONDUCTOR, CHIP (3216) (UX)	
JR517	1-216-296-91	CONDUCTOR, CHIP (3216) (UX)	
JR520	1-216-295-91	CONDUCTOR, CHIP (2012) (UX)	

< COIL >

Ref. No.	Part No.	Description	Remark
L101	1-410-482-31	INDUCTOR 100uH	
L202	1-410-470-11	INDUCTOR 10uH	
L251	1-410-513-11	INDUCTOR 22uH	
L401	1-410-482-31	INDUCTOR 100uH	
L402	1-410-515-11	INDUCTOR 33uH (B)	
L403	1-408-974-21	INDUCTOR 22uH	
L404	1-410-482-31	INDUCTOR 100uH	
L501	1-410-509-11	INDUCTOR 10uH	
L502	1-410-482-31	INDUCTOR 100uH	
L503	1-410-482-31	INDUCTOR 100uH	
L504	1-410-521-11	INDUCTOR 100uH	
L701	1-414-183-41	INDUCTOR 10uH	
L702	1-414-189-31	INDUCTOR 100uH	
L703	1-414-183-41	INDUCTOR 10uH	
L704	1-410-509-11	INDUCTOR 10uH	
L706	1-410-501-11	INDUCTOR 2.2uH	
L710	1-410-501-11	INDUCTOR 2.2uH	
L712	1-410-501-11	INDUCTOR 2.2uH	
L851	1-410-482-31	INDUCTOR 100uH	
L881	1-410-687-11	INDUCTOR 1.2mH	
L891	1-410-687-11	INDUCTOR 1.2mH	
L901	1-410-509-11	INDUCTOR 10uH (B)	
L902	1-410-509-11	INDUCTOR 10uH (B)	

< PIN CABLE >

Ref. No.	Part No.	Description	Remark
P701	1-555-110-00	CABLE, PIN	

< PHOTO INTERRUPTER >

Ref. No.	Part No.	Description	Remark
PH001	8-749-010-19	PHOTO INTERRUPTER GP3S113	
PH002	8-749-010-20	PHOTO INTERRUPTER GP3S114	

< IC LINK >

Ref. No.	Part No.	Description	Remark
⚠PS101	1-532-637-21	LINK, IC 1A (ICP-F25)	
⚠PS201	1-532-727-11	LINK, IC 0.25A (ICP-N5)	
⚠PS887	1-532-727-11	LINK, IC 0.25A (ICP-N5)	
⚠PS901	1-532-637-21	LINK, IC 1A (ICP-F25)	
⚠PS902	1-532-637-21	LINK, IC 1A (ICP-F25)	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q002	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q003	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q351	8-729-901-06	TRANSISTOR DTA144EK	
Q353	8-729-421-19	TRANSISTOR UN2213	
Q354	8-729-010-29	TRANSISTOR MSD601-RST1	
Q401	8-729-421-19	TRANSISTOR UN2213 (B)	
Q402	8-729-901-06	TRANSISTOR DTA144EK	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
Q404	8-729-216-22	TRANSISTOR 2SA1162-G	
Q405	8-729-010-29	TRANSISTOR MSD601-RST1 (B)	
Q406	8-729-010-05	TRANSISTOR MSB709-RT1	
Q407	8-729-010-05	TRANSISTOR MSB709-RT1	
Q502	8-729-027-34	TRANSISTOR DTA143EKA-T146	
Q503	8-729-421-19	TRANSISTOR UN2213	
Q702	8-729-421-19	TRANSISTOR UN2213	
Q703	8-729-141-03	TRANSISTOR 2SA733-QP	
Q704	8-729-010-05	TRANSISTOR MSB709-RT1	
⚠Q706	8-729-106-68	TRANSISTOR 2SD1615A-GP	
Q707	8-729-010-05	TRANSISTOR MSB709-RT1	
Q708	8-729-421-19	TRANSISTOR UN2213	
Q709	8-729-010-29	TRANSISTOR MSD601-RST1	
Q710	8-729-010-29	TRANSISTOR MSD601-RST1	
Q711	8-729-010-29	TRANSISTOR MSD601-RST1	
Q712	8-729-010-29	TRANSISTOR MSD601-RST1	
Q713	8-729-010-05	TRANSISTOR MSB709-RT1	
Q860	8-729-424-08	TRANSISTOR UN2111	
Q861	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q881	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
⚠Q882	8-729-216-22	TRANSISTOR 2SA1162-G	
Q889	8-729-010-29	TRANSISTOR MSD601-RST1	
Q891	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
⚠Q892	8-729-216-22	TRANSISTOR 2SA1162-G	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R001	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R002	1-247-881-00	CARBON 120K 5% 1/4W	
R003	1-249-437-11	CARBON 47K 5% 1/4W	
R004	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R005	1-249-413-11	CARBON 470 5% 1/4W	F
R006	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R007	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R008	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R009	1-216-031-00	METAL CHIP 180 5% 1/10W	
R010	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R011	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R012	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R015	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R016	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R017	1-249-400-11	CARBON 39 5% 1/4W	F
R018	1-249-400-11	CARBON 39 5% 1/4W	F
R019	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R051	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R052	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R053	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R054	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R071	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R072	1-216-073-00	METAL CHIP 10K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R101	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R102	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R103	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R104	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R105	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R106	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R107	1-216-037-00	METAL CHIP 330 5% 1/10W	
R108	1-216-121-91	METAL GLAZE 1M 5% 1/10W	
R109	1-208-790-11	METAL GLAZE 2.2K 0.50% 1/10W	
R110	1-208-782-11	METAL GLAZE 1K 0.50% 1/10W	
R111	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R126	1-208-790-11	METAL GLAZE 2.2K 0.50% 1/10W	
R210	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R214	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R217	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R219	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R220	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R224	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R225	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R226	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R256	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R257	1-249-429-11	CARBON 10K 5% 1/4W	
R258	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R262	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R263	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R264	1-216-103-91	METAL GLAZE 180K 5% 1/10W	
R265	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R266	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R271	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R274	1-249-434-11	CARBON 27K 5% 1/4W	
R275	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R276	1-216-056-00	METAL GLAZE 2K 5% 1/10W	
R277	1-216-068-00	METAL CHIP 6.2K 5% 1/10W	
R278	1-216-224-91	METAL GLAZE 12K 5% 1/8W	
R351	1-216-226-00	METAL GLAZE 15K 5% 1/8W	
R352	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R353	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R354	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R355	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R361	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R362	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R363	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R364	1-216-232-00	METAL GLAZE 27K 5% 1/8W	
R365	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R366	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R367	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R368	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R369	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R370	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R371	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R372	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R373	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R374	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R401	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R402	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R403	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R404	1-216-073-00	METAL CHIP	10K	5%	1/10W
R405	1-216-295-91	CONDUCTOR, CHIP (2012)			
R406	1-216-295-91	CONDUCTOR, CHIP (2012)			
R407	1-249-414-11	CARBON	560	5%	1/4W F
R408	1-216-101-00	METAL CHIP	150K	5%	1/10W
R409	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R410	1-216-043-91	METAL GLAZE	560	5%	1/10W
R411	1-216-025-91	METAL GLAZE	100	5%	1/10W
R412	1-216-295-91	CONDUCTOR, CHIP (2012)			
R413	1-216-295-91	CONDUCTOR, CHIP (2012)			
R414	1-216-081-00	METAL CHIP	22K	5%	1/10W
R415	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R416	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R417	1-216-033-00	METAL CHIP	220	5%	1/10W
R421	1-216-081-00	METAL CHIP	22K	5%	1/10W
R423	1-216-073-00	METAL CHIP	10K	5%	1/10W
R501	1-216-017-91	METAL GLAZE	47	5%	1/10W
R502	1-216-017-91	METAL GLAZE	47	5%	1/10W
R503	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R504	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R505	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R506	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R507	1-208-824-11	METAL GLAZE	56K	0.50%	1/10W
R508	1-208-822-11	METAL GLAZE	47K	0.50%	1/10W
R509	1-208-822-11	METAL GLAZE	47K	0.50%	1/10W
R510	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R511	1-208-824-11	METAL GLAZE	56K	0.50%	1/10W
R512	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R513	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R514	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R515	1-216-085-00	METAL CHIP	33K	5%	1/10W
R516	1-216-085-00	METAL CHIP	33K	5%	1/10W
R517	1-208-754-11	METAL GLAZE	68	0.50%	1/10W
R519	1-216-031-00	METAL CHIP	180	5%	1/10W
R520	1-216-029-00	METAL CHIP	150	5%	1/10W
R521	1-208-754-11	METAL GLAZE	68	0.50%	1/10W
R522	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R523	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R524	1-216-022-00	METAL CHIP	75	5%	1/10W
R525	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R526	1-216-041-00	METAL CHIP	470	5%	1/10W
R527	1-216-041-00	METAL CHIP	470	5%	1/10W

Ref. No.	Part No.	Description			Remark
R528	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R529	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R530	1-216-043-91	METAL GLAZE	560	5%	1/10W
R531	1-216-043-91	METAL GLAZE	560	5%	1/10W
R532	1-216-017-91	METAL GLAZE	47	5%	1/10W
R533	1-216-295-91	CONDUCTOR, CHIP (2012)			
R536	1-216-295-91	CONDUCTOR, CHIP (2012)			
R537	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R538	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R539	1-216-075-00	METAL CHIP	12K	5%	1/10W
R701	1-216-041-00	METAL CHIP	470	5%	1/10W
R702	1-216-041-00	METAL CHIP	470	5%	1/10W
R703	1-216-295-91	CONDUCTOR, CHIP (2012)			
R704	1-216-295-91	CONDUCTOR, CHIP (2012)			
R705	1-216-043-91	METAL CHIP	560	5%	1/10W
R706	1-216-105-91	METAL GLAZE	220K	5%	1/10W (B)
R706	1-216-083-00	METAL CHIP	27K	5%	1/10W (AS, NP, UX, NZ, VC)
R708	1-216-019-00	METAL CHIP	56	5%	1/10W
R709	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R710	1-216-295-91	CONDUCTOR, CHIP (2012)			
R711	1-216-073-00	METAL CHIP	10K	5%	1/10W
R712	1-216-025-91	METAL GLAZE	100	5%	1/10W
R713	1-216-019-00	METAL CHIP	56	5%	1/10W
R719	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R720	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R721	1-216-037-00	METAL CHIP	330	5%	1/10W
R722	1-249-418-11	CARBON	1.2K	5%	1/4W F
R723	1-216-081-00	METAL CHIP	22K	5%	1/10W
R724	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R725	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R726	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R727	1-216-077-00	METAL CHIP	15K	5%	1/10W
R728	1-216-075-00	METAL CHIP	12K	5%	1/10W
R731	1-216-025-91	METAL GLAZE	100	5%	1/10W
R732	1-216-025-91	METAL GLAZE	100	5%	1/10W
R738	1-216-025-91	METAL GLAZE	100	5%	1/10W
R739	1-216-025-91	METAL GLAZE	100	5%	1/10W
R741	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R742	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R743	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R744	1-216-043-91	METAL GLAZE	560	5%	1/10W
R853	1-215-467-00	METAL	82K	1%	1/6W
R854	1-208-812-11	METAL GLAZE	18K	0.50%	1/10W
R855	1-215-467-00	METAL	82K	1%	1/6W
R856	1-208-816-11	METAL GLAZE	27K	0.50%	1/10W
R858	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R861	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R862	1-216-109-00	METAL CHIP	330K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R863	1-216-073-00	METAL CHIP	10K	5%	1/10W
R864	1-216-041-00	METAL CHIP	470	5%	1/10W
R865	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R866	1-216-099-00	METAL CHIP	120K	5%	1/10W
R867	1-216-075-00	METAL CHIP	12K	5%	1/10W
R868	1-216-083-00	METAL CHIP	27K	5%	1/10W
R869	1-216-081-00	METAL CHIP	22K	5%	1/10W
R870	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R871	1-216-073-00	METAL CHIP	10K	5%	1/10W
R873	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R874	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R875	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R876	1-216-001-00	METAL CHIP	10	5%	1/10W
R877	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R878	1-216-079-00	METAL CHIP	18K	5%	1/10W
R881	1-216-081-00	METAL CHIP	22K	5%	1/10W
⚠R882	1-249-395-11	CARBON	15	5%	1/4W F
R883	1-249-417-11	CARBON	1K	5%	1/4W F
R884	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R885	1-216-091-00	METAL CHIP	56K	5%	1/10W
R887	1-216-295-91	CONDUCTOR, CHIP (2012)			
R891	1-216-083-00	METAL CHIP	27K	5%	1/10W
⚠R892	1-249-394-11	CARBON	12	5%	1/4W F
R893	1-249-417-11	CARBON	1K	5%	1/4W F
R894	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R896	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R897	1-216-073-00	METAL CHIP	10K	5%	1/10W
R898	1-216-085-00	METAL CHIP	33K	5%	1/10W
R899	1-216-095-00	METAL CHIP	82K	5%	1/10W
R905	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R906	1-216-049-91	METAL GLAZE	1K	5%	1/10W
		< RF MODULATOR >			
⚠RF701	1-467-958-21	MODULATOR, RF (RFU-2100)			
		< VARIABLE RESISTOR >			
RV201	1-238-019-11	RES, ADJ, CARBON 47K			
RV202	1-238-019-11	RES, ADJ, CARBON 47K			
RV887	1-238-019-11	RES, ADJ, CARBON 47K			
		< SWITCH >			
S002	1-570-953-11	SWITCH, PUSH (1 KEY) (REC PROOF)			
		< TRANSFORMER >			
T881	1-423-413-11	TRANSFORMER, BIAS OSCILLATION			
T891	1-423-415-11	TRANSFORMER, BIAS OSCILLATION			

Ref. No.	Part No.	Description			Remark
		< THERMISTOR (POSITIVE) >			
THP801	1-202-855-00	THERMISTOR, POSITIVE			
		< TUNER >			
⚠TU701	1-693-269-21	TUNER, IF (BTF-3WC441) (B)			
⚠TU701	1-693-267-21	TUNER, IF (BTF-3WC401) (AS, VC)			
⚠TU701	1-693-272-21	TUNER, IF (BTF-3WC411) (NP, NZ)			
⚠TU701	1-693-273-21	TUNER, IF (BTF-3WU601) (UX)			
		< VIBRATOR >			
X201	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)			
X401	1-577-289-11	VIBRATOR, CRYSTAL (17.7MHz)			
X402	1-577-165-11	VIBLATOR, CERAMIC (500kHz)			
*	A-6782-682-A	MF-271 BOARD, COMPLETE (VC)			
*	A-6782-685-A	MF-271 BOARD, COMPLETE (UX)			
*	A-6782-691-A	MF-271 BOARD, COMPLETE (B)			
*	A-6796-120-A	MF-271 BOARD, COMPLETE (NP)			
*	A-6796-226-A	MF-271 BOARD, COMPLETE (NZ)			
*	A-6796-227-A	MF-271 BOARD, COMPLETE (AS)			
		**********************			
		(Ref. No. 3,000 series)			
*	3-965-271-01	HOLDER, LCD			
	3-965-272-01	SHEET (A), DIFFUSION			
		< BUZZER >			
BZ101	1-529-104-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C101	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C102	1-164-346-11	CERAMIC CHIP	1uF		16V
C103	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C104	1-125-705-11	CAP, DOUBLE LAYERS	0.22F		
C105	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C106	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C107	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C108	1-128-057-11	ELECT	330uF	20%	6.3V
C109	1-128-057-11	ELECT	330uF	20%	6.3V
C110	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C111	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C113	1-164-346-11	CERAMIC CHIP	1uF		16V
C114	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C115	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C116	1-124-584-00	ELECT	100uF	20%	10V
C117	1-126-923-11	ELECT	220uF	20%	10V
C118	1-126-923-11	ELECT	220uF	20%	10V
C119	1-163-031-11	CERAMIC CHIP	0.01uF		50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
C151	1-126-157-11	ELECT	10uF	20%	16V
C152	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C153	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C154	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C155	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C156	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C161	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C162	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C163	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C171	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C172	1-124-261-00	ELECT	10uF	20%	50V
C174	1-126-160-11	ELECT	1uF	20%	50V
C176	1-124-589-11	ELECT	47uF	20%	16V
C177	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C178	1-124-589-11	ELECT	47uF	20%	16V
C179	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C194	1-136-015-00	CERAMIC CHIP	0.0033uF		50V
		< CONNECTOR >			
CN101	1-691-051-21	HOUSING, CONNECTOR 19P			
CN102	1-691-078-41	HOUSING, CONNECTOR 19P			
CN103	1-569-815-11	CONNECTOR, BOARD TO BOARD 21P			
* CN104	1-564-013-11	PIN, CONNECTOR 3P			
CN106	1-569-339-11	CONNECTOR, BOARD TO BOARD 7P			
CN107	1-564-002-11	PIN, CONNECTOR 3P (AS, B, NP, NZ, VC)			
		< JACK >			
CNJ101	1-766-861-21	JACK, PIN (3P) (LINE IN 2)			
CNJ102	1-695-312-11	JACK (SMALL TYPE) (MONO) (MIC)			
CNJ103	1-568-800-11	JACK, ULTRA SMALL (LANC)			
		< DIODE >			
D101	8-719-200-82	DIODE	11ES2		
D102	8-719-911-19	DIODE	1SS119-25		
D104	8-719-045-64	LED	SLR-342MC-A-47 (ON)		
D105	8-719-045-64	LED	SLR-342MC-A-47 (ON)		
D106	8-719-045-62	LED	SLR-342VC-A-47 (STANDBY)		
D107	8-719-045-62	LED	SLR-342VC-A-47 (VIDEO INSERT)		
D108	8-719-045-62	LED	SLR-342VC-A-47 (AUDIO INSERT)		
D109	8-719-911-19	DIODE	1SS119-25		
D110	8-719-911-19	DIODE	1SS119-25		
D111	8-719-109-93	DIODE	RD6.2ES-B2		
D151	8-719-911-19	DIODE	1SS119-25		
D194	8-719-109-93	DIODE	RD6.2ES-B2		
D195	8-719-109-93	DIODE	RD6.2ES-B2		
D196	8-719-108-12	DIODE	RD9.1E-W		
D197	8-719-108-12	DIODE	RD9.1E-W		
D198	8-719-108-12	DIODE	RD9.1E-W		
		< IC >			
IC101	8-759-248-87	IC	MM1256XF-BE		
IC102	8-759-364-46	IC	MB89099PF-G-105-BND		
IC103	8-759-279-61	IC	ST93CS66B1		
IC104	1-466-833-11	IC	RAY-CATCHER BLOCK, REMOCON		
IC151	8-759-249-78	IC	LC75850E		
IC171	8-759-924-46	IC	BA4560F		
		< JUMPER RESISTOR >			
JR101	1-216-295-91	CONDUCTOR, CHIP (2012)			
JR102	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
JR103	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
JR104	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
JR105	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
JR106	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
JR107	1-216-295-91	CONDUCTOR, CHIP (2012)			
JR108	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR201	1-216-295-91	CONDUCTOR, CHIP (2012)			
JR202	1-216-295-91	CONDUCTOR, CHIP (2012)			(AS, B, NP, NZ, VC)
JR203	1-216-295-91	CONDUCTOR, CHIP (2012)			(AS, B, NP, NZ, VC)
JR204	1-216-295-91	CONDUCTOR, CHIP (2012)			
JR205	1-216-295-91	CONDUCTOR, CHIP (2012)			
JR206	1-216-295-91	CONDUCTOR, CHIP (2012)			
		< COIL >			
L101	1-414-183-41	INDUCTOR 10uH			
L102	1-410-509-11	INDUCTOR 10uH			
L151	1-410-509-11	INDUCTOR 10uH			
L161	1-410-525-11	INDUCTOR 220uH			
L162	1-410-525-11	INDUCTOR 220uH			
L171	1-410-521-11	INDUCTOR 100uH			
L310	1-410-513-11	INDUCTOR 22uH			
		< DISPLAY PANEL >			
LC151	1-810-948-11	DISPLAY PANEL, LIQUID CRYSTAL			(AS, NP, NZ, UX, VC)
LC151	1-810-948-21	DISPLAY PANEL, LIQUID CRYSTAL (B)			
		< TRANSISTOR >			
Q101	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q102	8-729-027-44	TRANSISTOR	DTC114TKA-T146		
Q103	8-729-027-44	TRANSISTOR	DTC114TKA-T146		
Q104	8-729-027-24	TRANSISTOR	DTA114TKA-T146		
Q105	8-729-027-44	TRANSISTOR	DTC114TKA-T146		
Q106	8-729-140-75	TRANSISTOR	2SD999-CLCK		
Q107	8-729-027-44	TRANSISTOR	DTC114TKA-T146		
Q108	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q109	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR		

Ref. No.	Part No.	Description			Remark
Q110	8-729-140-75	TRANSISTOR	2SD999-CLCK		
Q111	8-729-216-22	TRANSISTOR	2SA1162-G		
Q112	8-729-018-99	TRANSISTOR	2SD2394-F		
Q113	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q171	8-729-230-49	TRANSISTOR	2SC2712-YG		
		< RESISTOR >			
R101	1-216-073-00	METAL CHIP	10K	5%	1/10W
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-073-00	METAL CHIP	10K	5%	1/10W
R104	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R105	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R106	1-216-113-00	METAL CHIP	470K	5%	1/10W
R107	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R108	1-216-095-00	METAL CHIP	82K	5%	1/10W
R109	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R112	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R113	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R114	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R115	1-216-295-91	CONDUCTOR, CHIP (2012)			
R116	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R117	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R118	1-216-073-00	METAL CHIP	10K	5%	1/10W
R119	1-216-073-00	METAL CHIP	10K	5%	1/10W
R120	1-216-020-00	METAL GLAZE	62	5%	1/10W
R121	1-216-033-00	METAL CHIP	220	5%	1/10W
R122	1-216-033-00	METAL CHIP	220	5%	1/10W
R123	1-216-033-00	METAL CHIP	220	5%	1/10W
R124	1-216-113-00	METAL CHIP	470K	5%	1/10W
R125	1-216-073-00	METAL CHIP	10K	5%	1/10W
R126	1-216-295-91	CONDUCTOR, CHIP (2012)			
R127	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R129	1-216-073-00	METAL CHIP	10K	5%	1/10W
R130	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R131	1-216-081-00	METAL CHIP	22K	5%	1/10W
R132	1-216-073-00	METAL CHIP	10K	5%	1/10W
R133	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R134	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R135	1-216-073-00	METAL CHIP	10K	5%	1/10W
R136	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R137	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R138	1-216-025-91	METAL GLAZE	100	5%	1/10W
R139	1-216-047-91	METAL GLAZE	820	5%	1/10W
R140	1-216-073-00	METAL CHIP	10K	5%	1/10W
R141	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R142	1-216-073-00	METAL CHIP	10K	5%	1/10W
R143	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R144	1-216-001-00	METAL CHIP	10	5%	1/10W
R145	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W
R152	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R161	1-216-295-91	CONDUCTOR, CHIP (2012)			
R162	1-216-022-00	METAL CHIP	75	5%	1/10W
R163	1-216-041-00	METAL CHIP	470	5%	1/10W
R164	1-216-041-00	METAL CHIP	470	5%	1/10W
R171	1-208-774-11	METAL GLAZE	470	0.50%	1/10W
R172	1-208-834-11	METAL GLAZE	150K	0.50%	1/10W
R173	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R174	1-216-085-00	METAL CHIP	33K	5%	1/10W
R175	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R176	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R177	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R178	1-216-085-00	METAL CHIP	33K	5%	1/10W
R179	1-216-081-00	METAL CHIP	22K	5%	1/10W
		< SWITCH >			
S101	1-571-977-11	SWITCH, TACTIL (ON/STANDBY)			
S102	1-571-977-11	SWITCH, TACTIL (⏏ EJECT)			
S103	1-571-977-11	SWITCH, TACTIL (EASY SET UP)			
S104	1-571-977-11	SWITCH, TACTIL (RF CHANNEL)			
S105	1-762-481-11	SWITCH, SLIDE (COMMAND MODE)			
		< VIBRATOR >			
X101	1-579-463-11	VIBRATOR, CRYSTAL (32kHz)			
X102	1-579-126-11	VIBRATOR, CERAMIC (12MHz)			

*	A-6782-676-A	MF-272 BOARD, COMPLETE **********************			
					(Ref. No. 3,000 series)
		< CAPACITOR >			
C301	1-124-584-00	ELECT	100uF	20%	10V
C302	1-162-638-11	CERAMIC CHIP	1uF		16V
C303	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C305	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C306	1-162-638-11	CERAMIC CHIP	1uF		16V
C308	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
		< CONNECTOR >			
CN301	1-569-814-11	CONNECTOR, BOARD TO BOARD 21P			
CN302	1-691-046-21	HOUSING, CONNECTOR 14P			
* CN303	1-695-822-11	CONNECTOR, BOARD TO BOARD 8P			
		< DIODE >			
D301	8-719-911-19	DIODE	1SS119-25		
D330	8-719-051-17	DIODE	SLR-342DCT31		
D331	8-719-045-62	DIODE	SLR-342VC-A-47		
D332	8-719-045-62	DIODE	SLR-342VC-A-47		

Ref. No.	Part No.	Description	Remark
D333	8-719-045-63	DIODE SLR-342YC-A-47	
		< IC >	
IC301	8-759-358-58	IC MB89096PF-G-204-BND	
		< JUMPER RESISTOR >	
JR301	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR350	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR351	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR352	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR353	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR354	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR355	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR356	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR365	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR366	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR367	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR368	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR369	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR370	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR372	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR373	1-216-295-91	CONDUCTOR, CHIP (2012)	
		< COIL >	
L301	1-410-509-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q330	8-729-027-59	TRANSISTOR DTC144EKA-T146	
Q331	8-729-027-59	TRANSISTOR DTC144EKA-T146	
Q332	8-729-027-59	TRANSISTOR DTC144EKA-T146	
Q333	8-729-027-59	TRANSISTOR DTC144EKA-T146	
		< RESISTOR >	
R301	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R302	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R303	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R304	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R305	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R306	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R307	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R308	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R309	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R310	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R311	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R312	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R313	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R314	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R315	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R316	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R318	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R319	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R320	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R321	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R330	1-216-029-00	METAL CHIP 150 5% 1/10W	
R331	1-216-037-00	METAL CHIP 330 5% 1/10W	
R332	1-216-037-00	METAL CHIP 330 5% 1/10W	
R333	1-216-029-00	METAL CHIP 150 5% 1/10W	
R334	1-216-033-00	METAL CHIP 220 5% 1/10W	
R335	1-216-037-00	METAL CHIP 330 5% 1/10W	
R336	1-216-029-00	METAL CHIP 150 5% 1/10W	
R340	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R341	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R342	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R343	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R344	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R345	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R346	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R347	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R348	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R349	1-216-073-00	METAL CHIP 10K 5% 1/10W	
		< SWITCH >	
S301	1-572-907-11	SWITCH, SLIDE (COLOR SYSTEM)	
S302	1-572-908-11	SWITCH, SLIDE (NTSC PB)	
S303	1-572-907-11	SWITCH, SLIDE (PICTURE)	
S304	1-572-907-11	SWITCH, SLIDE (TAPE SELECT)	
		< VIBRATOR >	
X301	1-579-463-11	VIBRATOR, CRYSTAL (32kHz)	
X302	1-579-126-11	VIBRATOR, CERAMIC (12MHz)	
*	A-6782-683-A	MF-273 BOARD, COMPLETE	
		**********************	
		(Ref. No. 3,000 series)	
		< CAPACITOR >	
C503	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C504	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C523	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C524	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
		< JACK >	
CJ501	1-764-788-11	JACK (SMALL TYPE) (PHONES)	
		< CONNECTOR >	
CN501	1-564-014-11	PIN, CONNECTOR 4P	

Ref. No.	Part No.	Description	Remark
CN502	1-569-336-11	CONNECTOR, BOARD TO BOARD 7P	
		< DIODE >	
D541	8-719-921-54	DIODE MTZJ-6.2B	
		< COIL >	
L502	1-410-525-11	INDUCTOR 220uH	
L503	1-410-520-11	INDUCTOR 82uH	
L522	1-410-525-11	INDUCTOR 220uH	
L543	1-410-520-11	INDUCTOR 82uH	
		< RESISTOR >	
R501	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R502	1-216-013-00	METAL CHIP 33 5% 1/10W	
R503	1-216-295-91	CONDUCTOR, CHIP (2012)	
R521	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R522	1-216-013-00	METAL CHIP 33 5% 1/10W	
R523	1-216-295-91	CONDUCTOR, CHIP (2012)	
R543	1-208-798-11	METAL GLAZE 4.7K 0.50% 1/10W	
R544	1-208-782-11	METAL GLAZE 1K 0.50% 1/10W	
R545	1-216-295-91	CONDUCTOR, CHIP (2012)	
R551	1-216-295-91	CONDUCTOR, CHIP (2012)	
R552	1-216-295-91	CONDUCTOR, CHIP (2012)	
		< VARIABLE RESISTOR >	
RV541	1-241-906-11	RES, VAR, CARBON 10K (REC BALANCE)	
RV542	1-223-392-11	RES, VAR, CARBON 50K (REC LEVEL)	
RV543	1-223-405-11	RES, VAR, CARBON 1K/1K (PHONE LEVEL)	
*	A-6782-684-A	PL-27 BOARD, COMPLETE	
		**********************	
		(Ref. No. 5,000 series)	
		< CONNECTOR >	
CN301	1-506-468-11	PIN, CONNECTOR 3P	
		< DIODE >	
D301	8-719-050-73	LED PG3365S-TP-J185K (LCD BACK LIGHT)	
D302	8-719-050-73	LED PG3365S-TP-J185K (LCD BACK LIGHT)	
D303	8-719-050-73	LED PG3365S-TP-J185K (LCD BACK LIGHT)	
D304	8-719-050-73	LED PG3365S-TP-J185K (LCD BACK LIGHT)	
D305	8-719-050-73	LED PG3365S-TP-J185K (LCD BACK LIGHT)	
D306	8-719-050-73	LED PG3365S-TP-J185K (LCD BACK LIGHT)	
		< PILOT LAMP >	
PL301	1-517-345-11	LAMP, PILOT (LCD BACK LIGHT)	
PL302	1-517-345-11	LAMP, PILOT (LCD BACK LIGHT)	
PL303	1-517-345-11	LAMP, PILOT (LCD BACK LIGHT)	
PL304	1-517-345-11	LAMP, PILOT (LCD BACK LIGHT)	
		< RESISTOR >	
R301	1-216-178-00	METAL GLAZE 150 5% 1/8W	
R302	1-216-178-00	METAL GLAZE 150 5% 1/8W	
R303	1-216-178-00	METAL GLAZE 150 5% 1/8W	
R304	1-216-178-00	METAL GLAZE 150 5% 1/8W	
R305	1-216-178-00	METAL GLAZE 150 5% 1/8W	
R306	1-216-178-00	METAL GLAZE 150 5% 1/8W	
*	A-6782-678-A	PS-345 BOARD, COMPLETE (AS, B, NP, NZ, VC)	
*	A-6782-686-A	PS-345 BOARD, COMPLETE (UX)	
		**********************	
		(Ref. No. 6,000 series)	
	7-685-646-81	SCREW +BVTP 3X8 TYPE2	
		< CAPACITOR >	
⚠C101	1-104-706-11	FILM 0.22uF 20% 250V	
⚠C102	1-104-705-11	FILM 0.1uF 20% 250V	
⚠C103	1-107-405-11	ELECT 68uF 20% 400V	
⚠C104	1-164-320-11	CERAMIC 0.001uF 10% 400V	
⚠C105	1-164-320-11	CERAMIC 0.001uF 10% 400V	
⚠C106	1-164-320-11	CERAMIC 0.001uF 10% 400V	
⚠C107	1-164-320-11	CERAMIC 0.001uF 10% 400V	
⚠C108	1-164-320-11	CERAMIC 0.001uF 10% 400V	
C121	1-126-935-11	ELECT 470uF 20% 16V	
C122	1-126-926-11	ELECT 1000uF 20% 10V	
C125	1-128-551-11	ELECT 22uF 20% 25V	
C131	1-128-499-11	ELECT 220uF 20% 16V	
C132	1-128-551-11	ELECT 22uF 20% 25V	
C133	1-124-589-11	ELECT 47uF 20% 16V	
C141	1-126-967-11	ELECT 47uF 20% 16V	
C142	1-126-933-11	ELECT 100uF 20% 16V	
C161	1-126-967-11	ELECT 47uF 20% 10V	
C162	1-126-924-11	ELECT 330uF 20% 6.3V	
C171	1-126-924-11	ELECT 330uF 20% 10V	
C181	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C182	1-126-967-11	ELECT 47uF 20% 16V	
C184	1-104-667-11	ELECT 22uF 20% 35V	
C185	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C186	1-126-967-11	ELECT 47uF 20% 50V	
C187	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C188	1-126-967-11	ELECT 47uF 20% 50V	
C191	1-126-967-11	ELECT 47uF 20% 16V	
C192	1-126-940-11	ELECT 330uF 20% 16V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		< AC INLET >	
⚠CJ101	1-251-134-11	INLET, AC (NONPOLAR) (AC IN ~)	
		< CONNECTOR >	
CN101	1-770-018-11	CONNECTOR, BOARD TO BOARD 19P	
* CN102	1-695-823-11	CONNECTOR, BOARD TO BOARD 8P	
		< COMPOSITION CIRCUIT BLOCK >	
⚠CP101	1-468-042-11	POWER BLOCK (AS, B, NP, NZ, VC)	
⚠CP101	1-468-043-11	POWER BLOCK (UX)	
⚠CP102	1-473-292-11	CONVERTER UNIT, DC/DC	
		< DIODE >	
⚠D101	8-719-510-06	DIODE S1WB60	
⚠D131	8-719-200-82	DIODE 11ES2	
D161	8-719-911-19	DIODE 1SS119-25	
D162	8-719-109-85	DIODE RD5.1ES-B2	
D191	8-719-911-19	DIODE 1SS119-25	
D192	8-719-947-41	DIODE MTZJ-T-72-9.1B	
		< FUSE >	
⚠F101	1-576-228-11	FUSE (H.B.C.) (T2AH/250V)	
		< FUSE HOLDER >	
FH101	1-533-293-11	FUSE HOLDER	
FH102	1-533-293-11	FUSE HOLDER	
		< IC >	
⚠IC141	8-759-189-48	IC PQ12RE11	
		< COIL >	
⚠L121	1-403-588-11	CIL. CHOKE 22uH	
⚠L122	1-403-588-11	CIL. CHOKE 22uH	
⚠L181	1-408-409-00	INDUCTOR 10uH	
		< LINE FILTER >	
⚠LF101	1-409-977-11	FILTER, LINE	
⚠LF102	1-409-977-11	FILTER, LINE	
		< IC LINK >	
⚠PS122	1-532-637-00	LINK, IC 1.0A (ICP-N25)	
⚠PS123	1-532-675-21	LINK, IC 1.5A (ICP-N38)	
⚠PS124	1-532-637-00	LINK, IC 1.0A (ICP-N25)	
⚠PS181	1-532-727-11	LINK, IC 0.25A (ICP-N5)	

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
⚠Q131	8-729-140-93	TRANSISTOR 2SB733-34	
Q132	8-729-421-22	TRANSISTOR UN2211	
⚠Q161	8-729-018-99	TRANSISTOR 2SD2394-F	
⚠Q191	8-729-140-98	TRANSISTOR 2SD773-34	
		< RESISTOR >	
⚠R101	1-214-947-00	METAL 2.7M 1% 1/2W	
R125	1-249-423-11	CARBON 3.3K 5% 1/4W	F
R131	1-249-417-11	CARBON 1K 5% 1/4W	F
R132	1-216-430-11	METAL OXIDE 390 5% 1W	F
R133	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R141	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R161	1-249-407-11	CARBON 150 5% 1/4W	F
R192	1-249-407-11	CARBON 150 5% 1/4W	F
		< SWITCH >	
S101	1-762-211-11	SWITCH, SLIDE (RF MODULATOR)	
*	A-6782-677-A	PV-17 BOARD, COMPLETE	
		*********************	
		(Ref. No. 3,000 series)	
		< CAPACITOR >	
C651	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C652	1-164-161-11	CERAMIC CHIP 0.0022uF 10% 100V	
C653	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C655	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C656	1-126-154-11	ELECT 47uF 20% 6.3V	
C657	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C658	1-126-157-11	ELECT 10uF 20% 16V	
C661	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C662	1-126-154-11	ELECT 47uF 20% 6.3V	
C666	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
CN651	1-766-719-11	CONNECTOR, BOARD TO BOARD 10P	
		< DIODE >	
D651	8-719-911-19	DIODE 1SS119-25	
D652	8-719-914-44	DIODE DAP202K	
D653	8-719-914-44	DIODE DAP202K	
		< IC >	
IC651	8-759-289-73	IC SDA5649X-GEG	
IC652	8-752-848-26	IC CXP80316-036Q	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		< JUMPER RESISTOR >	
JR651	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR652	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< COIL >	
L651	1-410-509-11	INDUCTOR 10uH	
L652	1-410-509-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q651	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
		< RESISTOR >	
R651	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R652	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R653	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R654	1-216-117-00	METAL CHIP 680K 5% 1/10W	
R655	1-216-123-11	METAL CHIP 1.2M 5% 1/10W	
R656	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R657	1-216-123-11	METAL CHIP 1.2M 5% 1/10W	
R658	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R659	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R660	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R661	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R662	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R663	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R664	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R666	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
		< VIBRATOR >	
X651	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	
*	A-6782-680-A	RV-44 BOARD, COMPLETE (AS, NP, UX, NZ, VC)	
*	A-6782-689-A	RV-44 BOARD, COMPLETE (B)	
		*********************	
		(Ref. No. 2,000 series)	
*	3-957-421-11	HOLDER, SECAM IC (B)	
		< CAPACITOR >	
C001	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
C002	1-163-123-00	CERAMIC CHIP 180PF 5% 50V	
C003	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C006	1-126-157-11	ELECT 10uF 20% 16V	
C007	1-126-154-11	ELECT 47uF 20% 6.3V	
C008	1-126-154-11	ELECT 47uF 20% 6.3V	
C009	1-126-154-11	ELECT 47uF 20% 6.3V	
C010	1-126-154-11	ELECT 47uF 20% 6.3V	
C011	1-163-031-11	CERAMIC CHIP 0.01uF 50V	

Ref. No.	Part No.	Description	Remark
C012	1-124-638-11	ELECT 22uF 20% 10V	
C014	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C073	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
C074	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	(B)
C075	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	(B)
C075	1-163-263-11	CERAMIC CHIP 330PF 5% 50V	(AS, NP, NZ, UX, VC)
C079	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C080	1-163-235-11	CERAMIC CHIP 22PF 5% 50V	
C081	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
C098	1-124-638-11	ELECT 22uF 20% 10V	
C099	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C203	1-163-121-00	CERAMIC CHIP 150PF 5% 50V	(B)
C206	1-163-031-11	CERAMIC CHIP 0.01uF 50V	(B)
C207	1-126-154-11	ELECT 47uF 20% 6.3V	(B)
C209	1-163-031-11	CERAMIC CHIP 0.01uF 50V	(B)
C251	1-124-638-11	ELECT 22uF 20% 10V	(B)
C260	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C261	1-124-584-00	ELECT 100uF 20% 10V	
C262	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C263	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C264	1-124-257-00	ELECT 2.2uF 20% 50V	
C265	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C267	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C268	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C269	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C270	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C273	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C274	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C275	1-126-160-11	ELECT 1uF 20% 50V	
C276	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C301	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C302	1-124-638-11	ELECT 22uF 20% 10V	
C303	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C304	1-126-163-11	ELECT 4.7uF 20% 50V	
C305	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C306	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C307	1-163-091-00	CERAMIC CHIP 8PF 50V	
C308	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C309	1-164-346-11	CERAMIC CHIP 1uF 16V	
C310	1-164-336-11	CERAMIC CHIP 0.33uF 25V	
C311	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C312	1-164-346-11	CERAMIC CHIP 1uF 16V	
C313	1-164-336-11	CERAMIC CHIP 0.33uF 25V	
C314	1-126-154-11	ELECT 47uF 20% 6.3V	
C315	1-163-243-11	CERAMIC CHIP 47PF 5% 50V	
C316	1-163-097-00	CERAMIC CHIP 15PF 5% 50V	
C317	1-163-249-11	CERAMIC CHIP 82PF 5% 50V	
C318	1-163-243-11	CERAMIC CHIP 47PF 5% 50V	

Ref. No.	Part No.	Description			Remark
C319	1-126-157-11	ELECT	10uF	20%	16V
C321	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C323	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C324	1-126-154-11	ELECT	47uF	20%	6.3V
C325	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C326	1-164-346-11	CERAMIC CHIP	1uF		16V
C327	1-164-346-11	CERAMIC CHIP	1uF		16V
C331	1-126-160-11	ELECT	1uF	20%	50V
C332	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C333	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C334	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C335	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C336	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C337	1-126-154-11	ELECT	47uF	20%	6.3V
C338	1-126-157-11	ELECT	10uF	20%	16V
C339	1-164-346-11	CERAMIC CHIP	1uF		16V
C340	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C341	1-164-346-11	CERAMIC CHIP	1uF		16V
C342	1-126-154-11	ELECT	47uF	20%	6.3V
C343	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C354	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C355	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C356	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C801	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C802	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C803	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C804	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C805	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C806	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C807	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C808	1-124-584-00	ELECT	100uF	20%	10V
C809	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C810	1-124-584-00	ELECT	100uF	20%	10V
C811	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C813	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C814	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C815	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C816	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C817	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C818	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C822	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (B)
C822	1-163-263-11	CERAMIC CHIP	330PF	5%	50V (AS, NP, NZ, UX, VC)
C826	1-124-229-00	ELECT	33uF	20%	10V
C827	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C829	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C830	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C836	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C838	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C839	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C840	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C842	1-126-160-11	ELECT	1uF	20%	50V
C851	1-163-125-00	CERAMIC CHIP	220PF	5%	50V (B)
C872	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V (B)
C873	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C890	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C893	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C894	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C895	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C896	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C897	1-126-157-11	ELECT	10uF	20%	16V
C899	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C901	1-163-091-00	CERAMIC CHIP	8PF		50V
C902	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C903	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C904	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C907	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C908	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C909	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C910	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C911	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C912	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C913	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C914	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C917	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C918	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C920	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C921	1-126-154-11	ELECT	47uF	20%	6.3V
C938	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C951	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C952	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C953	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C954	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C955	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C959	1-124-638-11	ELECT	22uF	20%	10V

< FILTER >

Ref. No.	Part No.	Description
CF301	1-527-849-00	FILTER, CERAMIC

< CONNECTOR >

Ref. No.	Part No.	Description
CN001	1-573-828-11	CONNECTOR, BOARD TO BOARD 14P
CN002	1-573-834-11	CONNECTOR, BOARD TO BOARD 20P
CN801	1-766-986-11	CONNECTOR, FFC/FPC 13P
• CN802	1-564-029-00	PIN, CONNECTOR 4P
• CN803	1-564-013-11	PIN, CONNECTOR 3P

< DIODE >

Ref. No.	Part No.	Description		Remark
D001	8-719-914-43	DIODE	DAN202K	
D301	8-719-914-43	DIODE	DAN202K (B)	
D801	8-719-914-43	DIODE	DAN202K	
D802	8-719-914-43	DIODE	DAN202K	
D803	8-719-914-43	DIODE	DAN202K	
D901	8-719-951-22	IC	IMN10	

< IC >

Ref. No.	Part No.	Description		Remark
IC001	1-467-887-21	IC	YC MODULE 2 (PAL) JFA1118	
IC201	1-810-636-11	IC	LA7356M-TLM (B)	
IC251	1-809-959-12	IC	TME656 (B)	
IC260	8-759-055-49	IC	AN3327K	
IC301	8-759-710-05	IC	NJM2238M	
IC302	8-759-342-10	IC	TL8812P	
IC304	8-759-324-99	IC	MM1118XFBE	
IC331	8-759-420-53	IC	AN3592K	
IC352	8-759-510-73	IC	BA10393F-E2	
IC353	8-759-008-67	IC	MC14066BF	
IC801	8-759-267-78	IC	HA118191ANT	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description		Remark
JR001	1-216-295-91	CONDUCTOR, CHIP (2012)	(B)	
JR002	1-216-295-91	CONDUCTOR, CHIP (2012)	(AS, NP, NZ, UX, VC)	

< COIL >

Ref. No.	Part No.	Description		Remark
L001	1-408-976-21	INDUCTOR 33uH		
L002	1-410-387-11	INDUCTOR CHIP 33uH		
L004	1-408-976-21	INDUCTOR 33uH		
L005	1-408-982-11	INDUCTOR 100uH		
L006	1-408-975-21	INDUCTOR 27uH		
L017	1-408-985-21	INDUCTOR 180uH		
L018	1-408-982-11	INDUCTOR 100uH		
L019	1-408-974-21	INDUCTOR 22uH		
L202	1-408-982-11	INDUCTOR 100uH (B)		
L251	1-408-982-11	INDUCTOR 100uH (B)		
L260	1-408-982-11	INDUCTOR 100uH		
L301	1-408-982-11	INDUCTOR 100uH		
L302	1-408-982-11	INDUCTOR 100uH		
L303	1-410-385-11	INDUCTOR CHIP 22uH		
L304	1-410-387-11	INDUCTOR CHIP 33uH		
L305	1-408-982-11	INDUCTOR 100uH		
L351	1-408-982-11	INDUCTOR 100uH		
L801	1-408-948-00	INDUCTOR 220uH		
L802	1-408-948-00	INDUCTOR 220uH		
L803	1-408-982-11	INDUCTOR 100uH		
L804	1-408-982-11	INDUCTOR 100uH		

Ref. No.	Part No.	Description		Remark
L810	1-408-985-21	INDUCTOR 180uH		
L812	1-408-982-11	INDUCTOR 100uH		
L813	1-408-970-21	INDUCTOR 10uH		
L814	1-408-970-21	INDUCTOR 10uH		
L871	1-408-977-21	INDUCTOR 39uH (B)		
L890	1-408-968-21	INDUCTOR 6.8uH		
L891	1-408-982-11	INDUCTOR 100uH		
L901	1-408-974-21	INDUCTOR 22uH		
L902	1-408-948-00	INDUCTOR 220uH		
L908	1-408-982-11	INDUCTOR 100uH		
L909	1-408-977-21	INDUCTOR 39uH		
L952	1-408-982-11	INDUCTOR 100uH		

< TRANSISTOR >

Ref. No.	Part No.	Description		Remark
Q005	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q006	8-729-027-59	TRANSISTOR	DTC144EKA-T146	
Q007	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	
Q008	8-729-027-56	TRANSISTOR	DTC143TKA-T146	
Q009	8-729-027-56	TRANSISTOR	DTC143TKA-T146	
Q018	8-729-027-38	TRANSISTOR	DTA144EKA-T146	
Q027	8-729-027-59	TRANSISTOR	DTC144EKA-T146 (B)	
Q033	8-729-027-59	TRANSISTOR	DTC144EKA-T146 (B)	
Q034	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q035	8-729-027-59	TRANSISTOR	DTC144EKA-T146 (B)	
Q301	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q302	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q303	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q304	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	
Q331	8-729-027-59	TRANSISTOR	DTC144EKA-T146	
Q351	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	
Q352	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q810	8-729-027-59	TRANSISTOR	DTC144EKA-T146	
Q811	8-729-921-12	TRANSISTOR	2SD1834	
Q817	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q818	8-729-027-59	TRANSISTOR	DTC144EKA-T146	
Q819	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q840	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q841	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q851	8-729-027-59	TRANSISTOR	DTC144EKA-T146 (B)	
Q871	8-729-120-28	TRANSISTOR	2SC1623-L5L6 (B)	
Q874	8-729-027-59	TRANSISTOR	DTC144EKA-T146 (B)	
Q890	8-729-216-22	TRANSISTOR	2SA1162-G	
Q891	8-729-216-22	TRANSISTOR	2SA1162-G	
Q892	8-729-027-59	TRANSISTOR	DTC144EKA-T146	
Q904	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q906	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q907	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q908	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q909	8-729-230-49	TRANSISTOR	2SC2712-YG	

Ref. No.	Part No.	Description				Remark
Q911	8-729-230-49	TRANSISTOR	2SC2712-YG			
Q912	8-729-216-21	TRANSISTOR	2SA1162-Y			
Q931	8-729-230-49	TRANSISTOR	2SC2712-YG			
Q938	8-729-027-59	TRANSISTOR	DTC144EKA-T146			
Q939	8-729-027-23	TRANSISTOR	DTA114EKA-T146			
Q951	8-729-926-23	TRANSISTOR	FMW-5			
Q952	8-729-822-48	TRANSISTOR	FC101			
Q953	8-729-926-23	TRANSISTOR	FMW-5			
Q955	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR			
Q956	8-729-027-23	TRANSISTOR	DTA114EKA-T146			

< RESISTOR >

Ref. No.	Part No.	Description				Remark
R001	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R003	1-216-054-00	METAL GLAZE	1.6K	5%	1/10W	
R004	1-208-798-11	METAL GLAZE	4.7K	0.50%	1/10W	
R005	1-216-037-00	METAL CHIP	330	5%	1/10W	
R006	1-208-750-11	METAL GLAZE	47	0.50%	1/10W	
R009	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R010	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R012	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R014	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R081	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(B)
R082	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R083	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R084	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R085	1-216-045-00	METAL CHIP	680	5%	1/10W	
R086	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R087	1-216-295-91	CONDUCTOR, CHIP (2012)				
R088	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R204	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	(B)
R205	1-216-049-91	METAL GLAZE	1K	5%	1/10W	(B)
R262	1-216-035-00	METAL CHIP	270	5%	1/10W	
R263	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R265	1-216-033-00	METAL CHIP	220	5%	1/10W	
R266	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R267	1-216-035-00	METAL CHIP	270	5%	1/10W	
R268	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R271	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R276	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R301	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R302	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R303	1-216-038-00	METAL CHIP	360	5%	1/10W	
R304	1-208-798-11	METAL GLAZE	4.7K	0.50%	1/10W	
R305	1-216-037-00	METAL CHIP	330	5%	1/10W	
R306	1-216-037-00	METAL CHIP	330	5%	1/10W	
R307	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R308	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R311	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R312	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R313	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R314	1-216-041-00	METAL CHIP	470	5%	1/10W	
R316	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R321	1-216-121-91	METAL GLAZE	1M	5%	1/10W	
R331	1-216-033-00	METAL CHIP	220	5%	1/10W	
R332	1-216-103-91	METAL GLAZE	180K	5%	1/10W	
R333	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R334	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R335	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R336	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R337	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R338	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R339	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R340	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R341	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R353	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R354	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R355	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R356	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R357	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R358	1-208-756-11	METAL GLAZE	82	0.50%	1/10W	
R359	1-208-758-11	METAL GLAZE	100	0.50%	1/10W	
R360	1-208-764-11	METAL GLAZE	180	0.50%	1/10W	
R361	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R362	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R363	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R364	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R365	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R366	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R801	1-216-023-00	METAL CHIP	82	5%	1/10W	
R802	1-216-037-00	METAL CHIP	330	5%	1/10W	
R805	1-211-955-11	METAL GLAZE	13	0.50%	1/10W	
R806	1-216-023-00	METAL CHIP	82	5%	1/10W	
R807	1-216-023-00	METAL CHIP	82	5%	1/10W	
R811	1-216-037-00	METAL CHIP	330	5%	1/10W	
R812	1-216-023-00	METAL CHIP	82	5%	1/10W	
R815	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R816	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R817	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R835	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R836	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R838	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R842	1-208-750-11	METAL GLAZE	47	0.50%	1/10W	
R843	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R844	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R846	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R847	1-216-078-00	METAL GLAZE	16K	5%	1/10W	
R856	1-216-033-00	METAL CHIP	220	5%	1/10W	
R857	1-216-033-00	METAL CHIP	220	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R858	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R859	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R860	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R861	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R862	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R863	1-216-047-91	METAL GLAZE	820	5%	1/10W	
R871	1-216-041-00	METAL CHIP	470	5%	1/10W	(B)
R874	1-216-049-91	METAL GLAZE	1K	5%	1/10W	(B)
R891	1-216-011-00	METAL CHIP	27	5%	1/10W	
R894	1-216-041-00	METAL CHIP	470	5%	1/10W	
R895	1-216-054-00	METAL GLAZE	1.6K	5%	1/10W	
R896	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R897	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R898	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R901	1-216-039-00	METAL CHIP	390	5%	1/10W	
R902	1-216-033-00	METAL CHIP	220	5%	1/10W	
R903	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R906	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R907	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R908	1-216-033-00	METAL CHIP	220	5%	1/10W	
R910	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R913	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R914	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R915	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R916	1-216-039-00	METAL CHIP	390	5%	1/10W	
R917	1-216-045-00	METAL CHIP	680	5%	1/10W	
R918	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R919	1-216-039-00	METAL CHIP	390	5%	1/10W	
R920	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R921	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R922	1-216-041-00	METAL CHIP	470	5%	1/10W	
R924	1-216-031-00	METAL CHIP	180	5%	1/10W	
R925	1-216-045-00	METAL CHIP	680	5%	1/10W	
R926	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R927	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R928	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R929	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R931	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R933	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R936	1-216-039-00	METAL CHIP	390	5%	1/10W	
R937	1-216-039-00	METAL CHIP	390	5%	1/10W	
R938	1-216-047-91	METAL GLAZE	820	5%	1/10W	
R939	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R947	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R951	1-208-820-11	METAL GLAZE	39K	0.50%	1/10W	
R952	1-208-802-11	METAL GLAZE	6.8K	0.50%	1/10W	
R953	1-208-792-11	METAL GLAZE	2.7K	0.50%	1/10W	
R954	1-208-802-11	METAL GLAZE	6.8K	0.50%	1/10W	
R955	1-208-770-11	METAL GLAZE	330	0.50%	1/10W	
R956	1-208-758-11	METAL GLAZE	100	0.50%	1/10W	
R957	1-208-790-11	METAL GLAZE	2.2K	0.50%	1/10W	
R958	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R959	1-208-802-11	METAL GLAZE	6.8K	0.50%	1/10W	
R960	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R961	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R962	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W	
R964	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R965	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R966	1-216-295-91	CONDUCTOR, CHIP (2012)				
R967	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV301	1-223-236-11	RES, ADJ, CARBON 1K
RV331	1-223-241-11	RES, ADJ, CARBON 47K

< TRANSFORMER >

Ref. No.	Part No.	Description
T331	1-409-467-11	COIL (TRAP 7.8K)

MISCELLANEOUS
****

Ref. No.	Part No.	Description
51	1-473-291-11	SWITCH BLOCK, CONTROL (VC)
51	1-473-291-21	SWITCH BLOCK, CONTROL (B)
51	1-473-291-31	SWITCH BLOCK, CONTROL (NP)
51	1-473-291-41	SWITCH BLOCK, CONTROL (UX)
51	1-473-291-51	SWITCH BLOCK, CONTROL (AS, NZ)
105	1-775-403-11	WIRE, FLAT TYPE (FMF-12) 19P
126	1-775-404-11	WIRE, FLAT TYPE (FMF-13) 19P
127	1-775-405-11	WIRE, FLAT TYPE (FCP-9) 11P
128	1-775-406-11	WIRE, FLAT TYPE (FCP-10) 15P (AS, B, NP, NZ, VC)
158	1-500-144-11	HEAD, FE
165	1-506-485-11	PIN, CONNECTOR 6P
203	8-848-623-01	DRUM ASSY, ROTARY UPPER (DZR-67-R)
221	8-848-639-01	DRUM ASSY, ROTARY LOWER (DZL-51-R)
260	1-762-076-11	SWITCH, ROTARY
M902	1-698-409-11	MOTOR, DC (CAPSTAN)
M903	X-3943-883-1	MOTOR ASSY, CAM

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS ******************************	
	1-473-267-11	REMOTE COMMANDER (V174) (NP, VC)	
	1-473-267-21	REMOTE COMMANDER (V174A) (B)	
	1-473-267-31	REMOTE COMMANDER (V174B) (UX)	
	1-473-267-41	REMOTE COMMANDER (V174C) (AS, NZ)	
	1-575-334-11	CORD (WITH CONNECTOR) (STEREO AV CABLE)	
	1-696-593-11	CORD, CONNECTION (PAL) (COAXIAL CABLE WITH F-TYPE)	
	1-696-819-11	CORD POWER (250V/2.5A) (AS, NZ)	
⚠	1-751-247-11	CORD, POWER (250V/2.5A) (B, NP, VC)	
	1-751-739-21	CORD, CONNECTION (LANC CONTROL CABLE)	
	1-769-285-11	CORD, CONNECTION (AERIAL CABLE)	
⚠	1-775-843-11	CORD, POWER (250V/5A) (UX)	
*	3-701-634-00	BAG, POLYETHYLENE	
	3-800-221-11	MANUAL, INSTRUCTION (ENGLISH) (UX)	
	3-800-221-21	MANUAL, INSTRUCTION (FRENCH, GERMAN, HUNGARIAN)	
	3-800-221-31	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE)	
	3-800-221-41	MANUAL, INSTRUCTION (SPANISH, DANISH, FINNISH)	
	3-800-221-51	MANUAL, INSTRUCTION (ITALIAN) (VC)	
	3-800-221-61	MANUAL, INSTRUCTION (FRENCH) (B)	
	3-800-221-71	MANUAL, INSTRUCTION (ENGLISH, FRENCH) (AS, NZ)	
*	3-948-574-01	SHEET (ROLL), PROTECTION	
*	3-960-471-01	CUSHION (UPPER)	
*	3-960-472-01	CUSHION (LOWER)	
*	3-965-274-01	INDIVIDUAL CARTON (NP, VC)	
*	3-965-274-11	INDIVIDUAL CARTON (UX)	
	3-965-274-21	INDIVIDUAL CARTON (B)	
*	3-965-274-31	INDIVIDUAL CARTON (AS)	
*	3-965-274-41	INDIVIDUAL CARTON (NZ)	

****

HARDWARE LIST

****

#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2
#2	7-682-645-01	SCREW +PS 3X4
#3	7-621-772-08	SCREW +B 2X3
#4	7-682-547-04	SCREW +P 3X6
#5	7-685-649-79	SCREW +BVTP 3X14 TYPE2
#6	7-685-646-79	SCREW (3X8)
#7	7-624-106-04	STOP RING 3.0, TYPE -E
#8	7-685-646-81	SCREW +BVTP 3X8 TYPE2

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 6
INTERFACE AND IC PIN FUNCTION

6-1. SYSTEM CONTROL—VIDEO BLOCK INTERFACE (MA-241 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	×2	PICTURE SEARCH		REC	REC • PAUSE
												CUE	REVIEW		
$\overline{\mathrm{V \cdot PB}}$	IC201(95)	O	H	H	H	H	H	L	L	L	L	L	L	H	H
RF SW P (SW25)	IC201①	O	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1	＊1
Q VD/V MUTE	IC201②	O	L	L	L	L	L	＊2	＊3	＊3	＊3	＊3	＊3	L	L
$\overline{\mathrm{NA \cdot SP}}$	IC201(92)	O	＊4	＊4	＊4	＊4	＊4	＊5	＊5	＊5	＊5	＊5	＊5	＊4	＊4
LP	IC201⑫	O	＊8	＊8	＊8	＊8	＊8	＊5	＊5	＊5	＊5	＊5	＊5	＊8	＊8
REC • P	IC201⑤	O	L	L	L	L	L	L	L	L	L	L	L	L	H
REC	IC201(96)	O	L	L	L	L	L	L	L	L	L	L	L	H	H
V SYNC	IC201(66)	I	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6	＊6
OSD MUTE	IC201(71)	O	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7	＊7
CTL REC	IC201(94)	O	L	L	L	L	L	L	L	L	L	L	L	H	L
$\overline{\mathrm{NTSC}}$	IC201㉗	O	H	H	H	H	H	H	H	H	H	H	H	H	H
JOG	IC201(97)	O	L	L	L	L	L	L	H	H	H	H	H	L	L
ORC SETTEI	IC201(76)	O	L	L	L	L	L	L	L	L	L	L	L	＊9	＊9

＊1. 25Hz 50% duty pulse synchronizing with drum rotation.
＊2. Normally "L" . "H" when the control signal is not detected.
＊3. V period "H" pulse.
＊4. "L" in the SP mode. Selected according to the recording mode.
＊5. Selected according to the tape recording mode.
＊6. Composite sync signal (positive).
＊7. "H" when menu screen or gray back screen.
＊8. Selected by REC mode, "L" in the SP mode.
＊9. "H" while APC is set.

Mode / Signal	SP	LP	EP
$\overline{\mathrm{SP}}$(92)	L	H	H
LP⑫	L	L	H

6-2. SYSTEM CONTROL—SERVO PERIPHERAL CIRCUIT INTERFACE (MA-241 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTH-READING	PB	PB • PAUSE	SLOW	×2	PICTURE SEARCH		REC	REC • PAUSE	PB INDEX WRT/ERS
												CUE	REVIEW			
REC CTL	IC201⑦	O	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	∗ 1	
$\overline{\text{CAP STOP}}$	IC201㊳	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	∗ 3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	IC201㉔	O	L	L	L	L	L	L	L	∗ 2	L	L	L	L	L	
CTL REC	IC201(94)	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL INDEX	IC201(96)	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
PB CTL	IC201(67)	I	H	∗ 6	∗ 6			∗ 1	H/L	∗ 2	∗ 6	∗ 6	∗ 6	∗ 1	H	
DRUM PG	IC201(68)	I	∗ 4	∗ 7	∗ 7	∗ 5	∗ 5	∗ 7	∗ 7	∗ 7	∗ 7	∗ 7	∗ 7	∗ 7	∗ 7	
DRUM FG	IC201(69)	I	∗ 4	∗ 8	∗ 8	∗ 5	∗ 5	∗ 8	∗ 8	∗ 8	∗ 8	∗ 8	∗ 8	∗ 8	∗ 8	
CAP FG	IC201(70)	I	H/L	∗ 6	∗ 6	∗ 5	∗ 5	∗ 6	H/L	∗ 9	∗ 6	∗ 6	∗ 6	∗ 6	H/L	
CAP DA	IC201(73)	O	∗ 10	∗ 10	∗ 10	∗ 10	∗ 10	∗ 11	∗ 10	∗ 10	∗ 11	∗ 11	∗ 11	∗ 11	∗ 10	
DRUM DA	IC201(74)	O	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	∗ 12	
CTL STEP	IC201(93)	O	L	L	L	L	L	L	L	∗ 13	L	L	L	L	L	

∗ 1. 25Hz pulse.
∗ 2. Pulse in tape running.
∗ 3. Reverse logic pulse of STEP PLS.
∗ 4. "L" when drum rotation stops
∗ 5. Unstable period pulse.
∗ 6. Pulse of period proportionate to tape speed.
∗ 7. 25Hz pulse.
∗ 8. 300Hz pulse.
∗ 9. Pulse in tape running.
∗ 10. Approx. 2 msec. period "H" or "L" pulse.
∗ 11. Approx. 1.5 msec. period "H" or "L" pulse.
∗ 12. Approx. 3 msec. period "H" or "L" pulse.
∗ 13. "H" in FWD direction and STEP drive.

6-3. SYSTEM CONTROL—MECHANISM BLOCK INTERFACE (MA-241 BOARD IC201)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB • PAUSE	SLOW	×2	PICTURE SEARCH		REC	REC • PAUSE
															CUE	REVIEW		
CAM LOAD	IC201⑬	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM UNLOAD	IC201⑭	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
CAM 12V	IC201㉛	O		H	L	H	L											
MODE 1	IC201(58)	I	H	L	L	∗1	∗1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	IC201(57)	I	L	L	L	∗1	∗1	L	L	L	H	H	H	H	H	H	H	H
MODE 3	IC201(56)	I	L	L	L	∗1	∗1	H	H	H	L	H	H	L	L	H	L	H
MODE 4	IC201(55)	I	L	H	H	∗1	∗1	H	L	L	L	L	L	L	L	L	L	L
REC PRF	IC201⑮	I	L	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2	∗2
T REEL FG	IC201(64)	I	H/L	H/L	H/L	H/L	H/L	H/L	∗3	∗3	∗3	H/L	∗3	∗3	∗3	∗3	∗3	H/L
S REEL FG	IC201(63)	I	H/L	H/L	H/L	∗3	∗3	H/L	∗3	∗3	∗3	H/L	∗3	∗3	∗3	∗3	∗3	H/L
END LED	IC201㉜	O (O.D)	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4	∗4
CAP TRQ 1	IC201㉞	O (O.D)	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	∗8	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z
CAP TRQ 2	IC201㉝	O (O.D)	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	L	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	L
CAP TRQ 3	IC201⑧	O (O.D)	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	H	H	HI-Z	HI-Z	∗9	HI-Z	H	H	HI-Z	HI-Z
$\overline{\text{CAP STOP}}$	IC201㊳	O (O.D)	L	L	L	H	H	L	H	H	H	L	∗5	H	H	H	H	L
CAP RVS	IC201(72)	O	H			L	H	H/L	L	H	L	L	L/∗5	L	L	H	L	L
CAP DA	IC201(73)	O	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10	∗10
T SENS	IC201⑰	I	∗4	∗4	∗4	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7
S SENS	IC201⑱	I	∗4	∗4	∗4	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7

∗ 1. Uncertainty
∗ 2. "L" when the erasing protection tab is bent, "H" when not bent.
∗ 3. Pulse of period proportionate to reel rotating speed.
∗ 4. Approx. 2 msec. period "H" pulse.
∗ 5. Pulse in tape running.
∗ 6. "L" only in tape running and when CAP RVS is "H".
∗ 7. Nomally "L". 2 msec. period "H" pulse when tape top or tape end is detected.
∗ 8. Normally HI-Z. "L" when capstan is in acceleration mode.
∗ 9. Normally HI-Z. "L" when capstan is in braking mode.
∗ 10. Approx. 3 msec. period "H" or "L" pulse.

6-4. SYSTEM CONTROL –SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-241 BOARD IC201)

Signal	Pin No.	I/O	I/O Level
$\overline{\text{ASURA RESET}}$	IC201㊵	I	Normally "H". "L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	IC201㊹	I	Chip select signal from the timer microprocessor. V period "L" pulse.
SI BUS	IC201㊺	I	Serial commiunication data from the timer microprocessor. V period "L" pulse.
SO BUS	IC201㊻	O	Serial communication data to the timer microprocessor. V period "L" pulse.
S CLK	IC201㊼	I	Serial communication clock with the timer microprocessor. V period "L" pulse.

6-5. SYSTEM CONTROL –AUDIO BLOCK INTERFACE (MA-241 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	×2	PICTURE SEARCH		REC	REC • PAUSE
												CUE	REVIEW		
AF ENVELOP	IC201(61)	I	AF RF envelope signal input pin for auto tracking.												
NA PB	IC201(83)	O	L	L	L	L	L	H	H	H	H	H	H	L	L
A MUTE	IC201㊲	O (O.D)	L	L	L	L	L	* 1	H	H	H	H	H	L	L
$\overline{\text{NA SP}}$	IC201(92)	O	* 2	* 2	* 2	* 2	* 2	* 3	* 3	* 3	* 3	* 3	* 2	* 2	* 2
NA REC·$\overline{\text{P}}$	IC201⑪	O	L	L	L	L	L	L	L	L	L	L	L	H	L
AF REC·$\overline{\text{P}}$	IC201④	O	L	L	L	L	L	L	L	L	L	L	L	H	L
AF SWP	IC201(100)	O	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1
AF SW POSITION	IC201(51)	I	Input pin for AF switching position adjustment.												
$\overline{\text{FULL ERS}}$	IC201㊱	O (O.D)	H	H	H	H	H	H	H	H	H	H	H	L	H

* 1. 25Hz 50% duty pulse approximately 5 msec. delayed from RF SW P.
* 2. Selected according to SP/LP selector. "L" in the SP mode, "H" in the LP mode.
* 3. Selected according to the tape recording mode. "L" in the SP mode, "H" in the LP mode.

6-6. SYSTEM CONTROL–RF MODULATOR, INPUT SELECTION BLOCK INTERFACE (MA-241 BOARD IC201)

Signal	Pin No.	I/O	I/O Level
MOD CONT	IC201⑲	O	"L" when RF modulator through.

Signal	Pin No.	I/O	I/O Level				
			TUNER	LINE 1	LINE 2	LINE 3	LINE 4
LINE 1	IC201(79)	O	L	H	L	H	H
LINE 2	IC201(82)	O	L	L	H	H	H
LINE 3	IC201(75)	O	L	L	L	L	L

6-7. SERVO/SYSTEM CONTROL MICROPROCESSOR CXP87248-096Q (MA-241 BOARD IC201) PORT FUNCTION DESCRIPTION

Pin No.	Signal	I/O	Function
1	$\overline{\text{RF SWP}}$	O	RF switching pulse.
2	QVD	O	False VD.
3	$\overline{\text{QHD}}$ ENBL	O	False HD voltage level control.
4	$\overline{\text{AF REC P}}$	O	Hi-Fi recording control.
5	REC P	O	Recording signal.
6	$\overline{\text{FE}}$ ON	O	Flying erase.
7	$\overline{\text{REC}}$ CTL	I/O	REC CTL.
8	CAP TRQ3	O	Capstan current control.
9	YNR	I/O	YNR control.
10	EDIT	O	EDIT control.
11	$\overline{\text{NA REC P}}$	I/O	Normal audio recording mode. H : recording mode.
12	LP	O	H in LP mode.
13	CAM LOAD	O	Loading motor rotaing direction control.
14	CAM UNLOAD	O	
15	C IN/$\overline{\text{REC PRF}}$	O	Cassette IN and erasing protection tab detection switch input.
16	HEAD CONT	I/O	Head change control.
17	T SENS	I	Tape top sensor input.
18	S SENS	I	Tape end sensor input.
19	MOD CONT	O	Modulator power supply ON/OFF control.
20	AV CONT	O	ON/OFF control.
21	ME SECAM	I	H : ME SECAM (Not used. (open))
22	SECAM	I	H : SECAM
23	VPB	O	Reverse VPB, H : Power OFF.
24	STEP PLS	O	Step pulse, H : Capstan step driving.
25	PAL 60	O	H : NTSC on PAL TV.
26	HEAD SEL	O	Video head select signal.
27	$\overline{\text{NTSC}}$	O	H : PAL.
28	JOG A MUTE	O	Hi-Fi audio mute signal.
29	C+ BIL	O	H output : Canal+ bilingual mode. (Not used. (open))
30	C+CONT	O	Canal+ control.
31	CAM 12V	O	CAM motor voltage change.
32	END LED	O	Top/end detection lamp lighting control.
33	CAP TRQ 2	O	Capstan current control signal 2. L : FF/REW to STOP.
34	CAP TRQ 1	O	Capstan current control signal 1. L : SLOW speed down.
35	PAL	O	H : PAL (Not used. (open))
36	$\overline{\text{FULL ERS}}$	O	Full erase control. (Not used. (open))
37	A MUTE	O	Audio mute. H : mute.
38	CAP $\overline{\text{STOP}}$	O	Capstan stop reversal. L : Capstan stop.
39	MP	I	Fixed to L.
40	$\overline{\text{ASURA RESET}}$	I	System reset input.
41	VSS		GND.
42	XTAL		System clock 16MHz.
43	EXTAL		
44	$\overline{\text{ASURA CS}}$	I	Chip select signal. (HI-6 board IC302)
45	SI BUS	I	Serial communication signal.
46	SO BUS	O	
47	S CLK	I	
48	METER (L)	I	L-ch audio level signal.
49	AD	I	AD input for APC 2.
50	METER (R)	I	R-ch audio level signal.
51	AFSW POS	I	Hi-Fi switching position adjustment.
52	A VSS		GND.
53	A VREF		AD port reference input. (UNSW 5V)
54	A VDD		UNSW 5V.
55	MODE 4	I	Cam encoder data 4.
56	MODE 3	I	Cam encoder data 3.
57	MODE 2	I	Cam encoder data 2.
58	MODE 1	I	Cam encoder data 1.
59	DEW	I	Condensation sensor input. "H" when condensation.
60	RF ENV	I	Video playback signal envelope.
61	AF ENV	I	Hi-Fi audio playback signal envelope.
62	RF SW POS	I	Video head switching position adjustment.
63	S REEL FG	I	S side reel FG input.
64	T REEL FG	I	T side reel FG input.
65	$\overline{\text{MIC SW}}$	I	MIC switch signal input.
66	V SYNC	I	Composite sync input.
67	PB CTL	I	Servo CTL input.
68	DRM PG	I	Drum PG input.
69	DRM FG	I	Drum FG input.
70	CAP FG	I	Capstan FG input.
71	OSD MUTE	O	Video output mute signal. H : Gray back. (Not used. (open))
72	CAP RVS	O	Capstan reverse control. H : Reverse
73	CAP DA	O	Capstan D/A output.
74	DRM DA	O	Drum D/A output.
75	LINE 3	O	Input selection control signal.
76	ORC SETTEI	O	H : ORC measure.
77	N. C.	I	(Not used. (fixed to H))
78	N. C.	I	(Not used. (fixed to H))

Pin No.	Signal	I/O	Function
79	LINE 1	O	Input selection control signal.
80	SO 1	I/O	Expanded port data.
81	CLK 1	I/O	Expanded port clock.
82	LINE 2	O	Input selection control signal.
83	NAPB	O	Audio output control signal. H : Normal audio playback.
84	PWM	O	PWM output for APC2.
85	SKEW ON	O	Skew control signal.
86	N. C.	I	Not used. (open)
87	TX		Not used. (open)
88	VSS		GND.
89	VDD		UNSW 5V.
90	VDD		UNSW 5V.
91	$\overline{\text{V SP}}$	O	For video. L : SP mode.
92	$\overline{\text{NA SP}}$	O	For normal audio. L : SP mode.
93	CTL STEP	O	CTL amp, STEP operation control.
94	CTL REC	O	H : CTL write.
95	$\overline{\text{V PB}}$	O	Video system playback mode reversal. L : Playback.
96	CTL INDEX	O	Index control signal rewrite. H : Erase.
97	JOG	O	H : JOG
98	REC	O	Head amplifier recording power supply.
99	LP HEAD	O	LP head use control. H : Playback LP mode.
100	$\overline{\text{AF}}$ SWP	O	AF switching pulse.

6-8. TIMER/TUNER CONTROL MICROPROCESSOR MB89099PF-G-105-BND (MF-271 BOARD IC102) PORT FUNCTION DESCRIPTION

Pin No.	Signal	I/O	Function
1	CL 1		Liquid crystal oscillation pin (32 kHz). (for clock)
2	CL 0		
3	MOD 0 (GND)		Operation mode specification pin (GND when used).
4	MOD 1 (GND)		
5	X 0		Liquid crystal oscillation pin (12 MHz). (for main)
6	X 1		
7	VSS		GND.
8	$\overline{\text{RESET}}$	I	Reset input pin.
9–11	N. C.	O	Not used (open)
12	$\overline{\text{HI V SYNC}}$	O	V sync output
13	$\overline{\text{PDC DET}}$	O	PDC detect.
14	$\overline{\text{TUNER V}}$	I	TUNER V Sync signal input.
15	$\overline{\text{ASURA/HI RESET}}$	O	S/S micom (MA-241 board IC201) reset signal.
16	$\overline{\text{HI CS}}$	O	Chip select signal. (MF-272 board IC301)
17	$\overline{\text{POWER FAIL}}$	I	Power voltage drop detection pin.
18	$\overline{\text{V SYNC}}$	I	V sync input.
19	POWER CONT	O	Main power supply control signal.
20	$\overline{\text{ASURA CS}}$	O	S/S micom chip select signal. (MA-241 board IC201)
21	H DET	I	H DET signal input.
22	$\overline{\text{PDC CS}}$	O	PDC chip select signal. (PV-12 board IC652)
23	SCL	I/O	I^2C BUS (clock)
24	SDA	I/O	I^2C BUS (data)
25	C+ CLK	O	Canal+ clock output.
26	C+ DET	I	Canal+ detect.
27	C+ DATA	O	Canal data output.
28	CMOD	I	Normally GND. 5V : Connected to micom jig.
29	$\overline{\text{PDC RESET}}$	O	PDC Reset.
30	SYS 1	O	Tuner system change signal output 1.
31	SYS 2	O	Tuner system change signal output 2.
32	SIRCS IN	I	Remote control input.
33	PLL CLOCK	O	Tuner PLL clock.
34	PLL DATA	O	Tuner PLL data.
35	PLL ENABLE	O	Tuner chip select.
36	TA MUTE	O	Tuner audio mute.
37	SIRCS OUT	O	SIRCS signal output.
38	$\overline{\text{A PRST}}$	O	Tuner sensitivity select signal for auto preset.
39–48	N. C.	O	Not used. (fixed to H)
49	VDD		D 6V.
50–52	N. C.	O	Not used. (fixed to H)
53	VFDP		D 6V.
54–57	N. C.	O	Not used. (fixed to H)
58	VSS		GND
59–66	N. C.	O	Not used. (fixed to H)
67	VDD		D 6V.
68–74	N. C.	O	Not used. (fixed to H)
75	N. C.	O	Not used. (open)
76	POWER CONT 2	O	Tuner power supply control.
77	SI BUS	I	Serial data input.
78	SO BUS	O	Serial data output.
79	S CLK	O	Serial communication clock.
80	MEM CS	O	EEPROM CS. (MF-271 board IC103)
81	MEM CLK	O	EEPROM CLOCK.
82	MEM DATA	I/O	EEPROM DATA.
83	AVSS		GND.
84	AFT	I	Ground wave tuner AFT detection.
85	RF AGC	I	Not used. (fixed to H)
86	TEST		Not used. (open)
87	BACK LIGHT CONT 1	O	LCD back light control signal output. (LAMP)
88	BACK LIGHT CONT 2	O	
89	LCD LED CONT	O	LCD back light control signal output. (LED)
90	VDIEO INSERT LED	O	Video insert LED control signal output.
91	AUDIO INSERT LED	O	Audio insert LED control signal output.
92	AVDD	I	D 6V.
93	N. C.	I	Not used. (open)
94	DEST 1	I	Destination discrimination.
95	N. C.	I	Not used. (open)
96	N. C.	I	Not used. (open)
97	LANC IN	I	LANC input.
98	LANC OUT	O	LANC output.
99	BUZZER	O	Buzzer output/clock liquid crystal frequency division output.
100	VDD		D 6V

6-9. MODE CONTROL MICROPROCESSOR MB89096PF-G-204-BND (MF-272 BOARD IC301) PORT FUNCTION DESCRIPTION

Pin No.	Signal	I/O	Function
1	CL 1		Liquid crystal oscillation pin (32 kHz). (for clock)
2	CL 0		
3	MOD 0 (GND)		Operation mode specification pin (GND when used).
4	MOD 1 (GND)		
5	X 0		Liquid crystal oscillation pin (12 MHz). (for main)
6	X 1		
7	VSS		GND.
8	$\overline{\text{RESET}}$	I	Reset input pin.
9	OPC LED	O	OPC LED ON signal output.
10	EDIT STBY LED	O	EDIT STBY LED ON Signal output.
11	PDC/VPS LED	O	PDC/VPS LED ON signal output.
12	SYNCHRO EDIT LED	O	SYNCHRO EDIT LED ON signal output.
13—15	N. C.		Not used. (open)
16	$\overline{\text{HI CS}}$	I	Chip select signal input. (MF-271 board IC102)
17	LCD RESET	O	LCD reset signal output. (Not used)
18	$\overline{\text{HI V SYNC}}$	I	V sync input.
19	$\overline{\text{CG CS}}$	O	Character generator chip select signal. (MA-241 board IC401)
20	$\overline{\text{LCD CS}}$	O	LCD driver chip select signal. (MF-271 board IC151)
21—24	N. C.		Not used. (open)
25	$\overline{\text{TIMER LED}}$	O	TIMER LED ON signal output.
26	$\overline{\text{REC LED}}$	O	REC LED ON signal output.
27	$\overline{\text{REMOTE LED}}$	O	REMOTE LED ON signal output.
28	CMOD	I	Normally GND. 5V : Connected to micom jig.
29	HI SI	I	Serial data input.
30	HI SO	O	Serial data output.
31	HI SCK	I	Serial communication clock.
32	SIRCS IN	I	Remote control input.
33—48	N. C.		Not used. (open)
49	VDD		D 6V.
50—52	N. C.		Not used. (open)
53	VFDP		GND
54—57	N. C.		Not used. (open)
58	VSS		GND
59—66	N. C.		Not used. (open)
67	VDD		D 6V.
68—76	N. C.		Not used. (open)
77	SI BUS	I	Serial data input.
78	SO BUS	O	Serial data output.
79	S CLK	O	Serial communication clock.
80	MOD SW	I	RF MODULATOR switch signal input.
81, 82	N. C.		Not used. (open)
83	AVSS		GND.
84—87	A/D0—A/D3	I	Membrane key reading.
88	A/D 4	I	Not used.
89—91	A/D 5—A/D7	I	Membrane key reading.
92	AVDD	I	D 6V.
93—96	A/D8-A/D11	I	Membrane key reading.
97	JOG 1	I	JOG/SHUTTLE switch signal input.
98	JOG 2	I	
99	N. C.		Not used. (open)
100	VDD		D 6V

SECTION 7
ADJUSTMENTS

7-1. MECHANICAL ADJUSTMENTS

For the procedures how to adjust and check the mechanism, as well as how to replace mechanical parts, refer to the VHS Mechanical Adjustment Manual IV (H MECHANISM) (9-973-623-11).

However, for the procedures how to set the Track Shift mode, refer to the following text.

7-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 7-12 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

[Instruments for Use]

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30MHz or more, with delay mode (A probe 10: 1 should be used unless otherwise specified.)
3) Frequency counter (8 columns or more)
4) PAL and SECAM pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion rate meter
10) Sound dual multiplex signal generator
11) Alignment tape
    Part No : H7099052H (MH-2)
13) Extension cable
    ① MF-271 Board
    - MF-271 board CN101 ↔ MA-241 board CN904
      Part No : J-6090-053-A (19 pin)

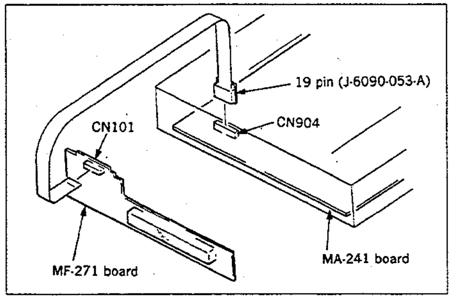

19 pin (J-6090-053-A)
CN904
CN101
MF-271 board
MA-241 board

Fig. 7-2-1.

② RV-44 Board
- RV-44 board CN001 ↔ MA-241 board CN908
  Part No : J-6090-025-A (14 pin)
- RV-44 board CN002 ↔ MA-241 board CN907
  Part No : J-6090-043-A (20 pin)
- RV-44 board CN801 ↔ Drum head flexible
  Part No : J-6090-054-A (13 pin)

③ HF-34 Board
- HF-34 board CN101 ↔ MA-241 board CN902
- HF-34 board CN102 ↔ MA-241 board CN901
  Part No : J-6090-047-A (11 pin)

④ PV-17 Board
- PV-17 board CN651 ↔ MA-241 board CN903
  Part No : J-6090-048-A (10 pin)

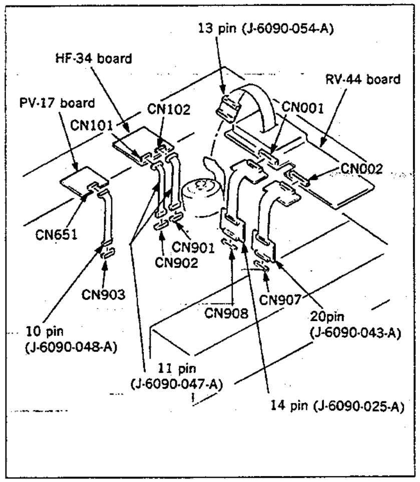

13 pin (J-6090-054-A)
HF-34 board
RV-44 board
PV-17 board
CN102
CN001
CN101
CN002
CN651
CN901
CN902
CN903
CN907
CN908
20pin
(J-6090-043-A)
10 pin
(J-6090-048-A)
11 pin
(J-6090-047-A)
14 pin (J-6090-025-A)

Fig. 7-2-2.

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown is the following diagram.

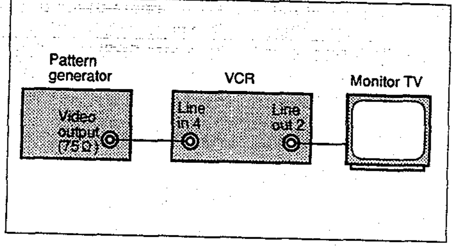


Fig. 7-2-3.

Unless otherwise specified, place the switches and controls of this unit in the following positions:

- INPUT SELECT switch ································LINE 4
- TAPE SPEED (SP/LP) switch ····························SP
- COLOUR SYSTEM switch ····························AUTO

2-1-3. Check of Input Signal

Because the video signal obtained from the pattern generator is used as the adjustment signal for the adjustment, the video output signal is required to satisfy the specified value.

Connect the oscilloscope to the picture input terminal (terminal board). And check that the synchronizing signal amplitude of the video signal is approximately 0.3V, the amplitude of the picture part is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and is flat, and the ratio of level between the burst signal and the "red" signal is 0.30: 0.66. The video signal (color bar) used for the adjustment is shown in the fig. 7-2-4.

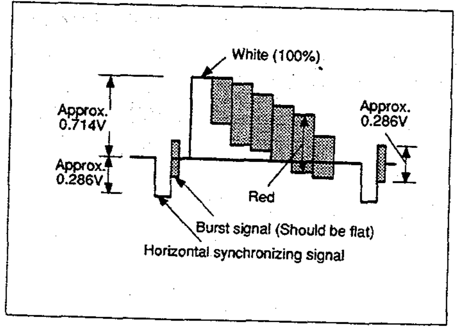

White (100%)
Approx. 0.714V
Approx. 0.286V
Approx. 0.286V
Red
Burst signal (Should be flat)
Horizontal synchronizing signal

Fig. 7-2-4. Color bar signal of the pattern generator

2-1-4. Alignment Tape

- Contents of MH-2 (Normal-VHS)

	Mode	Period	Video signal	Audio signal
1	SP	10 minutes	Stair step	7kHz
2		5 minutes	—	3kHz
3		10 minutes	Color bar	1kHz
4		3 minutes	RF sweep	—

2-1-5. Specified Input-output Level and the Impedance

EURO-AV (LINE 1)

21-pin
Video input: pin 20
Audio input: pins 2 and 6
Video output: pin 19
Audio output: pins 1 and 3

EURO-AV (LINE IN 3)

21-pin
Video input: pin 20
Audio input: pins 2 and 6

LINE IN 2
LINE IN 4

VIDEO IN, Photo jack (1)
Input signal: 1 Vp-p, 75Ω unbalanced, sync negative
AUDIO IN, Phono jack (2)
Input level: 327 mVrms
Input impedance: more than 47kΩ

LINE OUT 2

VIDEO OUT, Photo jack (1)
Output signal: 1 Vp-p, 75Ω (unbalanced), sync negative
AUDIO OUT, Phono jack (2)
Rated output level: 327 mVrms
Load impedance: 47kΩ
Output impedance: less than 10kΩ

MIC (PLUG IN POWER)

Minijack (1), 0.775 mVrms, for low impedance microphone

PHONES

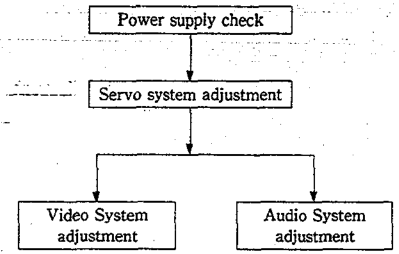
Stereo minijack (1), 38.8 mVrms, 8Ω

LANC

Stereo mini-minijack

2-1-6. Adjustment Procedures

Perform the adjustment following the procedures given below.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (PS-345Board)

Mode	E-E
Measuring instrument	Digital voltmeter
38V check	
Measurement point	CN101 Pin ①
Specified value	38±3Vdc
13V check	
Measurement point	CN101 Pin ③④
Specified value	13±1Vdc
MTR12V check	
Measurement point	CN101 Pin ⑤⑥
Specified value	12.1±1.0Vdc
SW12V check	
Measurement point	CN101 Pin ⑩
Specified value	12.0±0.5Vdc
SW5V check	
Measurement point	CN101 Pin ⑫
Specified value	5.2±0.5Vdc
D 6V check	
Measurement point	CN101 Pin ⑭
Specified value	5.9±0.5Vdc
−9V check	
Measurement point	CN101 Pin ⑱
Specified value	−9±0.5Vdc
D 6V check	
Measurement point	CN102 Pin ⑤
Specified value	5.9±0.5Vdc
SW 9V check	
Measurement point	CN102 Pin ⑦
Specified value	9±0.5Vdc

[Check Method]

1) Check that each voltage satisfies the specified value.

2-3. SERVO SYSTEM ADJUSTMENT

2-3-1. RF Switching Position Adjustment (MA-241 Board)

[Adjustment Object]

To adjust the link of the Ach and Bch of the tape playback outputs.

To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback (SP)
Signal	Alignment tape: MH-2 SP color bar portion
Measurement point	CH1: Video Line out terminal CH2: CN802 pin ③ (RF SWP) (RV-44 board)
Measuring instrument	Oscilloscope
Adjustment element	RV202
Specified value	6.5±0.5H (416±32μsec)

[Adjustment Method]

1) Set TRACKING switch (Remote comander) to MANUAL. ("Auto tracking" display will disappear on the display window indicator.)
2) Press the tracking buttons ▼ and ▲ and adjust the tracking position to the center.
3) Adjust to 416±32μsec (6.5±0.5H) using RV202.

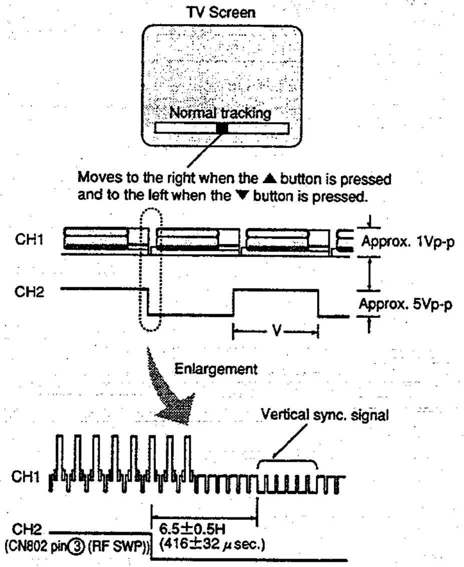


Fig. 7-2-5.

2-4. VIDEO SYSTEM ADJUSTMENTS

For the video system adjustment, follow the adjustment procedures given below as a rule. The color bar video signal supplied from the pattern generator is used as the video input signal for the video system adjustment of the recording mode. Check that the signal satisfies the specified value designated in the "Check of input signal (Fig. 7-2-4).

[Adjustment Sequence]

1) X'tal OSC check
2) SYNC AGC check
3) White clip/Dark clip check
4) Y FM carrier frequency check
5) Playback Y level check
6) PAL JOG adjustment
7) 0.5H CCD level adjustment

2-4-1. X'tal OSC Check (RV-44 Board)

Mode	Playback
Signal	Alignment tape: Color bar portion
Measurement point	IC001 pin ㉗
Measuring instrument	Oscilloscope and Frequency counter
Specified value	PAL: 4,433619±82Hz

Note: A frequency counter should be connected through a buffer ampifier (oscilloscope, etc.) having a high-impedance and a low capacitance.

[Check Method]

1) Check that the oscillation frequency satisfies the specified value and that the oscillation voltage is 450±200mVp-p.

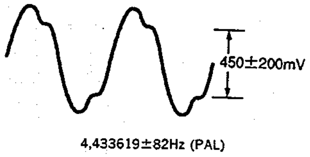


Fig. 7-2-6.

2-4-2. SYNC AGC Check (RV-44 board)

Mode	E-E
Signal	Color bar
Measurement point	Video output terminal
Measuring instrument	Oscilloscope
Specified value	A=2.05±0.14Vp-p

[Check Method]

1) Check that the SYNC AGC level (A) satisfies the specified value.

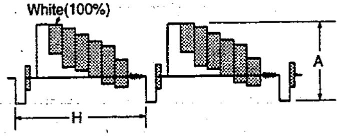


Fig. 7-2-7.

2-4-3. White Clip/Dark Clip Check (RV-44 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC001 pin ⑦
Measuring instrument	Oscilloscope
Specified value	White clip: 190±15% Dark clip: 52±10%

[Check Method]

1) Check that the white clip level is 190±15% to the white (100%) level.
2) Check that the dark chip level is 52±10% to the white (100%) level.

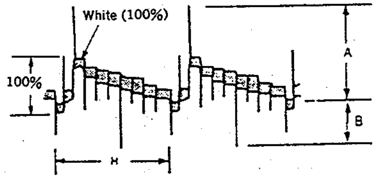


Fig. 7-2-8.

2-4-4. Y FM Carrier Frequency Check (RV-44 Board)

Mode	E-E
Signal	No-signal
Measurement point	Q34 Emitter
Measuring instrument	Frequency counter
Specified value	3.80±0.13MHz

Note: A frequency counter should be connected through a buffer amplifier (oscilloscope, etc.) having a high impedance and a low capacitance.

[Check Method]

1) Check that the carrier frequency satisfies the specified value.

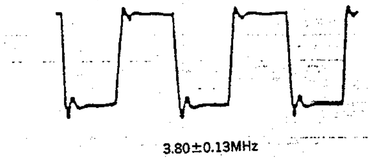


Fig. 7-2-9.

2-4-5. Playback Y Level Check (RV-44 Board)

Mode	Playback
Signal	Alignment tape: SP mode color bar portion
Measurement point	Video utpuc terminal
Measuring instrument	Oscilloscope
Specified value	A=2.05±0.18Vp-p

[Check Method]

1) Check that the playback Y level satisfies the specified value.

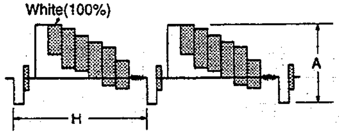


Fig. 7-2-10.

2-4-6. PAL JOG Adjustment (RV-44 Board)

[Adjustment Object]

This is a voltage adjustment to adjust the frequency of AFC. If improper, this causes disturbed picture during LP variable speed playback.

Mode	E-E
Signal	Color bar (PAL)
Measurement point	IC331 pin ⑲ IC331 pin ⑳ (for check)
Measuring instrument	Oscilloscope (DC)
Adjusting element	RV331
Specified value	A=2.5±0.05Vdc

[Adjusting Method]

1) Adjust signal at IC331 pin ⑲ to A=2.5±0.05Vdc and waveform at IC331 pin ⑳ must be oscillating at twice input video signal.

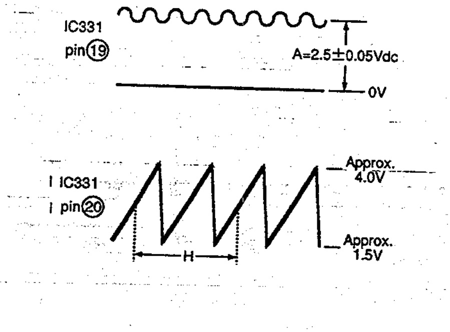


Fig. 7-2-11.

2-4-7. 0.5H CCD Level Adjustment (RV-44 Board)

[Adjustment Object]

This adjust the video level of CCD output.
If improper, this causes flicker during LP STILL and change in brightness between noise bars during LP CUE/REVIEW.

Mode	E-E
Signal	Color bar (PAL)
Measurement point	IC304 pin ①, ③
Measuring instrument	Oscilloscope
Adjusting element	RV301
Specified value	A=B

[Adjusting Method]

1) IC304 pin ③ level is adjusted so that it has same level with IC304 pin ①

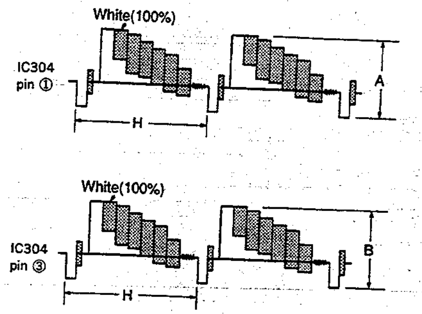


Fig. 7-2-12.

2-5. AUDIO SYSTEM ADJUSTMENTS

- For the adjustment of the audio system, perform in the SP mode if there is no special notes. Use the alignment tape.
- Adjust both LCH and RCH.

[Connection of Equipment for Audio Measurement]

In addition to equipment for video measurement, the audio measurement equipment should be connected as illustrated below.

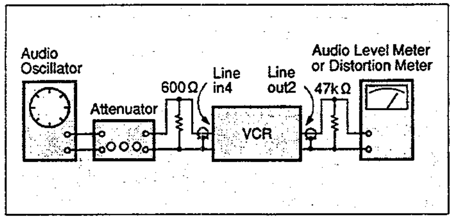


Fig. 7-2-13.

● Hi-Fi Audio System Adjustment

Perform the adjustment setting the switches and controls on the following positions if there is no special indications.

INPUT SELECT switch ....LINE 4
AUDIO MONITOR * ....Stereo

* Remote commander

[Adjustment Sequence]

1. VCO f₀ adjustment
2. Deviation check
3. Band pass filter f₀ Adjustment
4. AF Switching position adjustment

2-5-1. VCO f_0 Adjustment (HF-34 Board)

[Adjustment Object]

To attain HiFi audio compatibility.
If this specification is not satisfied, the sound will be distorted.

Mode	Recording
Signal	No-signal
Measuring instrument	Frequency counter
1.3MHz adjustment	
Measurement point	IC101 pin ⑲ (Lch RF) (JL111)
Adjustment element	RV103 (Lch)
Specified value	1400±1kHz
1.7MHz adjustment	
Measurement point	IC101 pin ㉚ (Rch RF) (JL110)
Adjustment element	RV102 (Rch)
Specified value	1800±1kHz

Note: Connect the frequency counter through the buffer amplifier (oscilloscope, etc) with high input resistance (1MΩ or more) and low capacity (10pF or less).

[Adjustment Method]

1) Connect the frequency counter with each measurement points.
2) Adjust with RV103 and RV102 so that the frequency satisfies each specified value.

2-5-2. Deviation Check (HF-34 Board)

Mode	Recording
Signal	400Hz, −12dBs: CN102 pin ①, ③
Measurement point	IC101 pin ⑲ (Lch) (JL111) IC101 pin ㊿ (Rch) (JL110)
Measuring instrument	Frequency counter
Specified value	50±5kHz

[Check Method]

1) Check that the frequency satisfies the specified value.

○ HF-34 Board (COMPONENT SIDE)

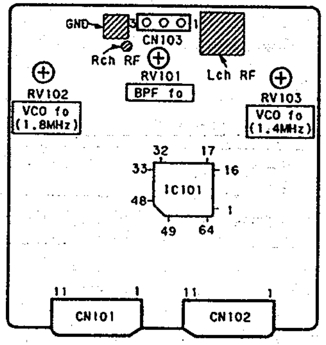

GND
3
1
CN103
Rch RF
RV101
BPF fo
Lch RF
RV102
VCO fo (1.8MHz)
RV103
VCO fo (1.4MHz)
32
17
33
16
IC101
48
1
49
64
11
1
11
1
CN101
CN102

Fig. 7-2-14.

2-5-3. Band Pass Filter f_0 Adjustment (HF-34 board)

[Adjustment Object]

To separate the carrier accurately and ensure that the filter for cutting the video signal functions normally.

If this specification is not satisfied, the sound will be distored.

Mode	Playback
Signal	1.505MHz, 200mVp-p: CN103 pin ①
Measurement point	IC101 pin ⑲ (Lch RF) (JL111) IC101 pin ㊿ (Rch RF) (JL110)
Measuring instrument	Oscilloscope
Adjustment element	RV101
Specified value	Adjust the A and B amplitudes to the same level. (A−B=±2mVp-p)

[Connection]

1) Disconnect CN103 of the HF-34 board and input the 1.505MHz and 200mVp-p sine wave from the signal generaor to Pin ① of CN103.

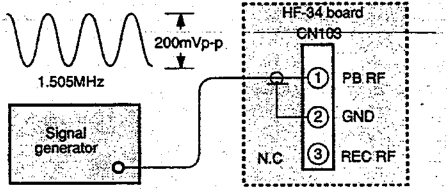

200mVp-p
1.505MHz
Signal generator
HF-34 board
CN103
① PB RF
② GND
③ REC RF
N.C

Fig. 7-2-15.

[Adjustment Method]

1) Rotate RV101 fully in the counterclockwise direction (∩) as seen from the component side.
2) Rotate RV101 slowly in the clockwise direction (∩) until the amplitudes of Pin ⑲ of IC101 and Pin ㊿ of IC101 become equal.

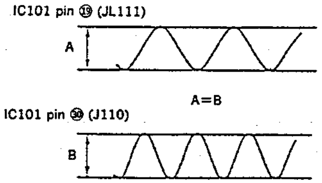

IC101 pin ⑲ (JL111)
A
A=B
IC101 pin ㊿ (J110)
B

Fig. 7-2-16.

2-5-4. AF Switching Position Adjustment (MA-241 Board)

[Adjustment Object]

To adjust the link of the Ach and Bch of the tape playback outputs.

If this specification is not satisfied, the noise will increase and cracking sounds will be produced.

Mode	Playback
Signal	Alignment tape
Measurement point	CH1: IC101 pin ⑲ (Lch RF) (JL111) CH2: CN802 pin ③ (RF SWP) (RV-44 board)
Measuring instrument	Oscilloscope
Adjustment element	RV201
Specified value	No dropouts in the RF signal

[Adjustment Method]

1) Set TRACKING switch (Remote comander) to MANUAL. ("Auto tracking" display will disappear on the display window indicator.)
2) Press tracking buttons ▼ and ▲ and adjust the tracking position to the center.
3) Adjust to the minimum specified value using RV201.

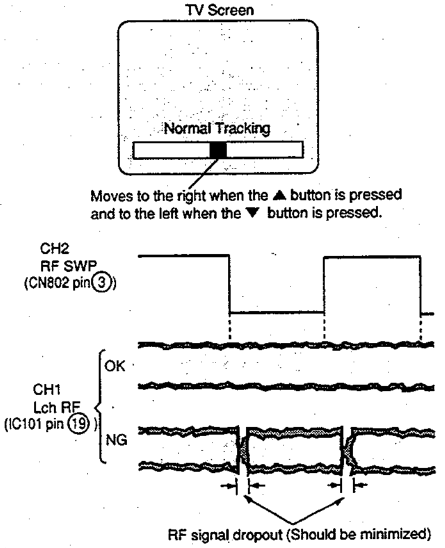

TV Screen
Normal Tracking
Moves to the right when the ▲ button is pressed and to the left when the ▼ button is pressed.
CH2 RF SWP (CN802 pin③)
CH1 Lch RF (IC101 pin ⑲)
OK
NG
RF signal dropout (Should be minimized)

Fig. 7-2-17.

- **Normal Audio System Adjustment**

- Adjust in the SP mode if there is no special indications.
- Perform the adjustment setting the switch on the following positions.

INPUT SELECT switch ....LINE 1

AUDIO MONITOR switch................NORMAL*1

＊1: No indicates on the display window indicator and monitor TV.

[Adjustment Method]

1. ACE head adjustment....Refer to the VHS mechanical part adjustment manual IV
2. Recording bias adjustment
3. E-E output level check

2-5-5. ACE Head Adjustment

Refer to the "VHS Mechanical adjustment manual IV" (9-973-623-11).

2-5-6. Recording Bias Adjustment (MA-241 Board)

Mode	Self-record playback
Signal	400Hz, −27.5dBs } Audio line in 1 7kHz, −27.5dBs } (L or R)
Measurement point	Audio line out (L or R)
Measuring instrument	Audio level meter
Adjustment element	RV887
Specified value	0±1dBs

[Adjustment Method]

1) Supply a signal of 400Hz, −27.5dBs to Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate −27.5dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400Hz and 7kHz.
7) Confirm that the 7kHz playback output levels within a range of the 400Hz playback output level 0±1dB. When it is out of this range, sdjust RV887 and repeat the steps 1) through 7) above.

	Direction of Rotating RV887
400Hz level>7kHz level	Clockwise (∩)
400Hz level<7kHz level	Counterclockwise (∩)

2-5-7. E-E Output Level Check

Mode	E-E
Signal	400Hz, −7.5dBs: Audio Line in 1
Measurement point	Audio line output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Input signal of 400Hz and −7.5dBs to the L and R channel of the audio input at the same time.
2) Check that the audio output level is −7.5±2dBs.

2-5-8. Overall Output Level and Distortion Factor Check

Mode	Self-record playback
Signal	400Hz, −7.5dBs: Audio Line Input 1 terminals, left and right
Measurement point	Audio Line Output terminals, left and right
Measuring instrument	Audio level meter and Distortion meter
Specified value	Playback Level: −7.5±3dBs Distortion: 4.0% or less

[Check Method]

1) Record signal.
2) Playback the recorded portion.
3) Check that the output level is −7.5±3dBs.
4) Check that the distortion factor is 4.0% or less on the left and right side.

2-5-9. Overall Noise Level Check

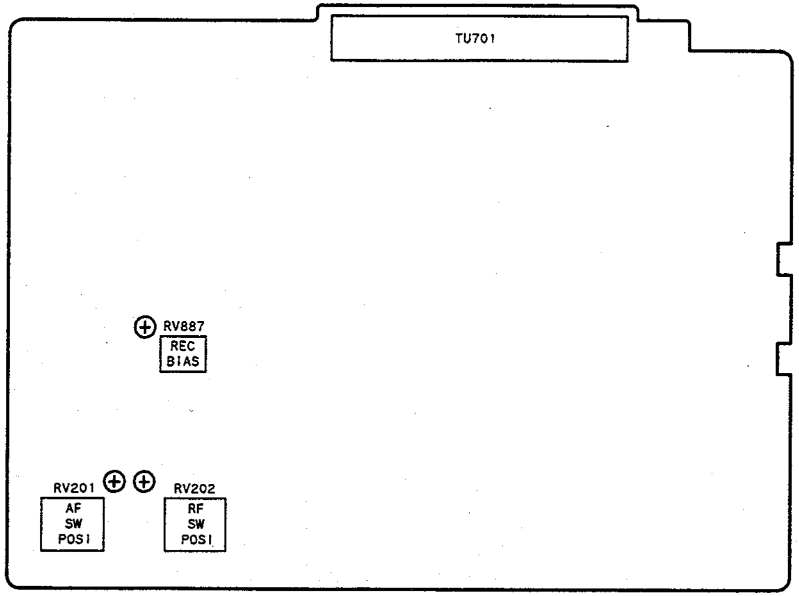
Mode	Self-record playback
Signal	No signal (Insert a shorting plug into the Audio Line Input jacks, left and right.)
Measurement point	Audio Line Output terminals, left and right
Measuring instrument	Audio level meter
Specified value	−46dBs or less

[Checking Method]

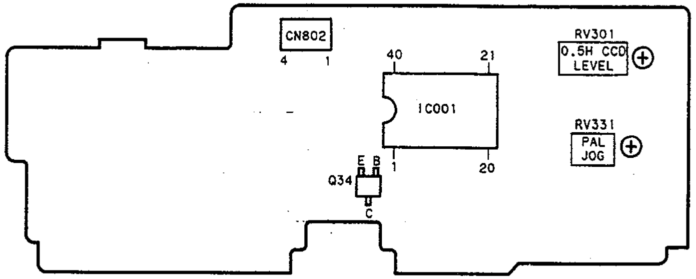
1) Record.
2) Playback recorded portion.
3) Check that noise level is −46dBs or less on the left and right side.

2-6. ADJUSTMENT PARTS LOCATION DIAGRAM

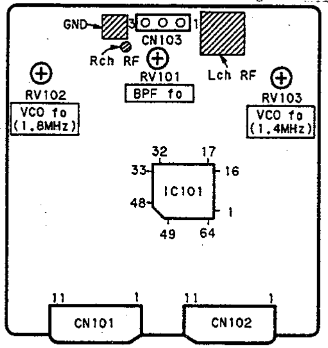
MA-241 BOARD (COMPONENT SIDE)


TU701
RV887
REC BIAS
RV201
AF SW POSI
RV202
RF SW POSI

RV-44 BOARD (COMPONENT SIDE)


CN802
4
1
40
21
IC001
1
20
E B
Q34
C
RV301
0.5H CCD LEVEL
RV331
PAL JOG

HF-34 BOARD
(COMPONENT SIDE)


GND
3
1
CN103
Rch RF
RV101
BPF fo
Lch RF
RV102
VCO fo (1.8MHz)
RV103
VCO fo (1.4MHz)
32
17
33
16
IC101
48
1
49
64
11
1
CN101
11
1
CN102

SLV-E1000AS/B/NP/NZ/UX/VC
RMT-V174/V174A/V174B/V174C

SONY®
SERVICE MANUAL

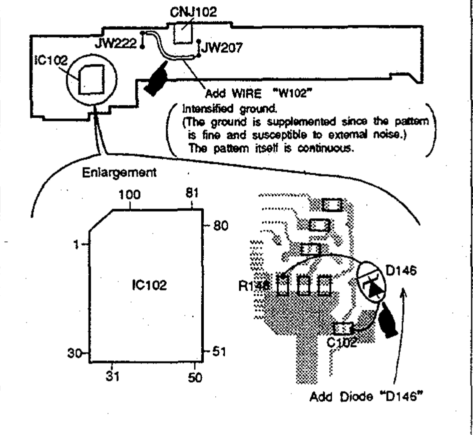
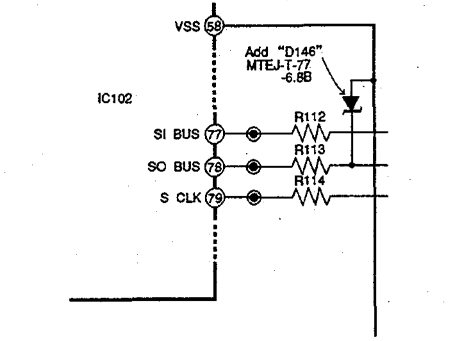
AEP Model
SLV-E1000VC
UK Model
SLV-E1000UX
Spanish Model
North European Model
SLV-E1000NP
French Model
SLV-E1000B
Australian Model
SLV-E1000AS
Newzealand Model
SLV-E1000NZ

CORRECTION-1

Correct your service manual as shown below.

1. MF-271 Board Page 4-30, 4-33

☛ : **Change Portion**

Printed wiring board	Schematic Diagram
	

CNJ102
JW222
JW207
IC102
Add WIRE "W102"
Intensified ground.
(The ground is supplemented since the pattern is fine and susceptible to external noise.)
The pattern itself is continuous.
Enlargement
100
81
80
1
IC102
30
31
50
51
R148
D146
C102
Add Diode "D146"
VSS 58
Add "D146" MTEJ-T-77 -6.8B
IC102
SI BUS 77
SO BUS 78
S CLK 79
R112
R113
R114

5-2. ELECTRICAL PARTS LIST (Page 5-18)

Ref. No.	Formar	New
D146	No Mount	RD6.8ESB2 8-719-109-97

SLV-E1000AS/B/NP/NZ/UX/VC
RMT-V174/V174A/V174B/V174C

SONY®
SERVICE MANUAL

AEP Model
SLV-E1000VC
UK Model
SLV-E1000UX
Spanish Model
North European Model
SLV-E1000NP
French Model
SLV-E1000B
Australian Model
SLV-E1000AS
Newzealand Model
SLV-E1000NZ

SUPPLEMENT-1

File this supplement with the service manual.
(96-001)

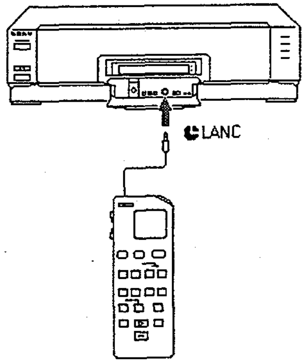
Subject: Input data of EEP ROM addition

- When replacing EEP ROM(IC103) on MF-271 board, it is necessary to set the data on page D as follows;
- Before changing the data on page D, change the data on page1 address 00 from 00 to 01.

D PAGE MEMORY MAP

Address	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
E1000AS	05	5F	00	44	2E	00	E3	03	00	00	00	00	00	00
E1000B	03	5F	61	44	35	00	E3	03	00	00	00	00	00	00
E1000NP	01	5F	00	44	37	00	E3	03	00	00	00	00	00	00
E1000NZ	04	5F	00	44	37	00	E3	03	00	00	00	00	00	00
E1000UX	00	5F	70	44	31	00	E3	03	00	00	00	00	00	00
E1000VC	02	5F	00	44	2E	00	E3	03	00	00	00	00	00	00

- How to hook up
  Adjusting remote commander.



Adjusting remote commander
[J-6082-053-B]

- See next page about the input method of data.

9-973-792-81

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96C0459-1
Printed in Japan

© 1996. 3

Published by Personal A&V Products Div.
Quality Engineering Dept.

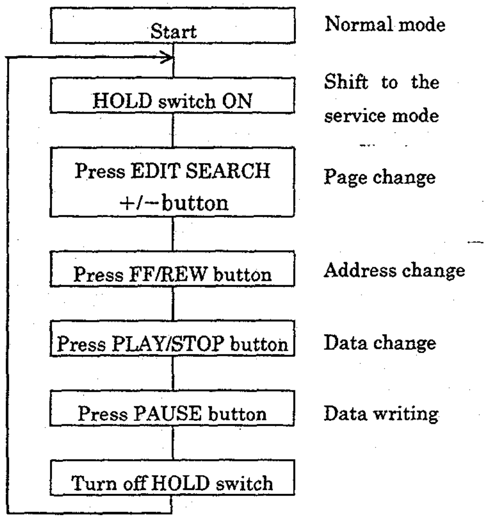
<SERVICE MODE>

1.SETTING THE SERVICE MODE

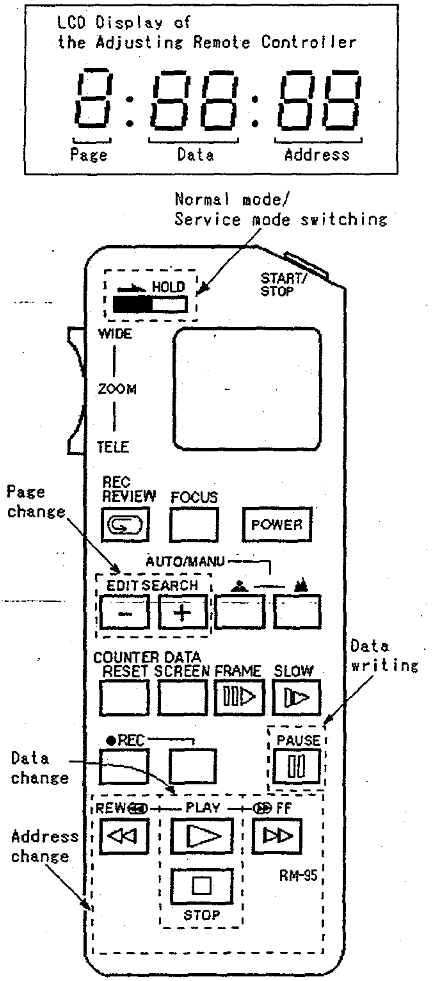
The service mode consists of the adjustment mode which adjusts the EVR and the test mode which shows the condition of the unit.

The unit can be set into the mode and adjustment mode by connecting the adjusting remote commander (Set the HOLD switch to 'HOLD').

(1)Shifting to the service mode using the adjusting remote commander.


Start
Normal mode
HOLD switch ON
Shift to the service mode
Press EDIT SEARCH +/−button
Page change
Press FF/REW button
Address change
Press PLAY/STOP button
Data change
Press PAUSE button
Data writing
Turn off HOLD switch

Adjusting remote commander RM-95 (J-6082-053-B)


LCD Display of
the Adjusting Remote Controller
8:88:88
Page
Data
Address
Normal mode/
Service mode switching
HOLD
START/
STOP
WIDE
ZOOM
TELE
REC
REVIEW
FOCUS
POWER
Page
change
AUTO/MANU
EDIT SEARCH
−
+
COUNTER DATA
RESET SCREEN FRAME SLOW
Data
writing
●REC
PAUSE
Data
change
REW
PLAY
FF
Address
change
STOP
RM-95

Command mode	Command function	Normal LANC Command
Page up	Page +1	Edit Search +
Page down	Page −1	Edit Search −
Direct Page Set	Sets to the specified page	Event clear
Address Up	Address +1	Fast Forword
Address Down	Address −1	Rewind
Data Up	Data +1	Play Back
Data Down	Data −1	Stop
Store	Writes data in the EEPROM	Pause

---

2. MF-272 Board Page 4-32, 4-35 Circumference IC301 (Change Parts)

5-2. ELECTRICAL PARTS LIST (Page 5-20)

Ref. No.	Formar	New
JR353, 354, 355 JR365, 366, 367, 368, 369 JR370, 372, 373	0Ω (1-216-295-91) CONDUCTOR CHIP	1kΩ (1-216-049-91) METAL CHIP 5% 1/10W

3. Corrected Service manual Parts No.

Incorrect	Correct
9-732-792-11	9-973-792-11

Sony Corporation
Consumer A & V Products Company
Home A & V Products Div.

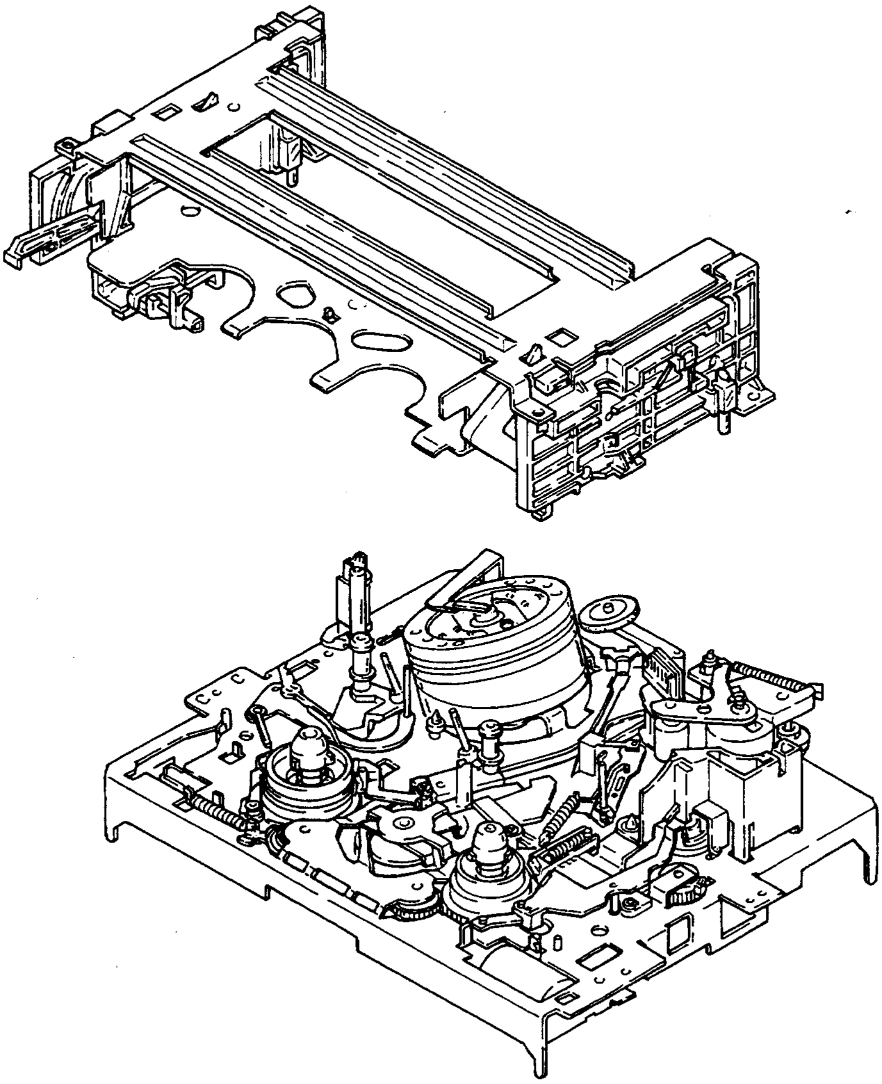
English
95H0471-1
Printed in Japan
© 1995. 8

Published by Personal A & V Products Div.
Quality Engineering Dept.

VHS MECHANICAL ADJUSTMENT MANUAL IV

H MECHANISM

Please use with the service manual.



VHS VIDEO CASSETTE RECORDER

MICROFILM

SONY®

TABLE OF CONTENTS

Section *Title* *Page*

1. PREPARATION FOR MECHANISM CHECK ADJUSTMENT AND REPLACEMENT

1-1. Loading and Threading Procedure When the Power Turns Off (Fig. 1-1) 3
  1-1-1. Loading and Threading Procedure With Hands 3
  1-1-2. Loading and Threading Procedure With Regulated DC Power Supply 3
1-2. Unloading and Unthreading Procedure When the Power Turns Off (Figs. 1-2 and 1-3) 4
  1-2-1. Unloading and Unthreading Procedure With Hands 4
  1-2-2. Unloading and Unthreading Procedure With Regulated DC Power Supply 4
1-3. How to Complete Threading Without Cassette Compartment (Fig. 1-4) 6

2. PERIODIC CHECK AND REPLACEMENT

2-1. Cleaning of Rotating Head Disk Assembly 7
2-2. Cleaning of the Tape Movement System 7
2-3. Cleaning the Drive System 7
2-4. Periodic Check Items 8
2-5. Tools and Fixtures Required for Servicing 9

3. MAINLY MECHANICAL PARTS REPLACEMENT

3-1. FL Block Assembly (Fig. 3-1) 10
3-2. Drum Assembly (Fig. 3-2) 11
3-3. Timing Belt (Fig. 3-3) 12
3-4. Cap Brake Assembly (Fig. 3-4) 13
3-5. TG2 Roller, FE Head Assembly (Fig. 3-5) 14
3-6. Pinch Press Block Assembly, Elevator Gear (Fig. 3-6) 15
3-7. Ace Block Assembly (Fig. 3-7) 16
3-8. TG3, TG6 Guide Roller Assemblies (Fig. 3-8) 17
3-9. Capstan Motor (Fig. 3-11) 19
3-10. Main Brake Assemblies S and T (Fig. 3-12) 20
3-11. Soft Brake T Assembly (Fig. 3-13) 21
3-12. RVS Brake Arm Assembly, Reel Table (T) Assembly (Fig. 3-14) 22
3-13. TG8 Assembly (Fig. 3-15) 23
3-14. TG8 Holder (Fig. 3-16) 24
3-15. TG8 and Press Gears (Fig. 3-17) 25
3-16. Cam Motor Chassis Block Assembly, Upper/Lower Communication Gear (Fig. 3-18) 26
3-17. Rotary Encoder Switch (Fig. 3-19) 27
3-18. Main Slider (Fig. 3-20) 28
3-19. Shuttle T Block and Loading Gear T Block Assemblies (Fig. 3-21) 29
3-20. Shuttle S Block and Loading Gear S Block Assemblies (Fig. 3-22) 30
3-21. Reel Table (S) Assembly (Fig. 3-23) 31
3-22. TG1 Assembly (Fig. 3-24) 32
3-23. S Winding Block Assembly (Fig. 3-25) 33
3-24. Trigger Lever and RKB Block Assemblies (Fig. 3-26) 34

4. ADJUSTMENT

4-1. Tape Path Adjustment 35
  4-1-1. Tension Regulator (TG1) Position/ Tension Adjustment (Fig. 4-1) 35
  4-1-2. TG8 Guide Roller Height Adjustment (Fig. 4-2) 36
  4-1-3. Height Adjustment of Guide Rollers No. 3 and No. 6 (Fig. 4-3) 36
  4-1-4. Ace Head Assembly Adjustment (Rough Adjustment) (Figs. 4-4 and 4-5) 37
  4-1-5. Ace Head Assembly Adjustment (Precision Adjustment) 38
  4-1-6. X-Value Adjustment 38
  4-1-7. Adjustments After Replacing the Drum (Video Head) 40
  4-1-8. Checking the Tension and Torque 42

1. PREPARATION FOR MECHANISM CHECK ADJUSTMENT AND REPLACEMENT

Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF (Fig. 1-1)

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓐ direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9 V (300 mA) to cam motor with regulated DC power supply makes it loading and threading.

Note: When loading and threading without cassette, claws are caught in four positions as following figure (in the order ① → ② → ③ → ④).
So release them with hands.

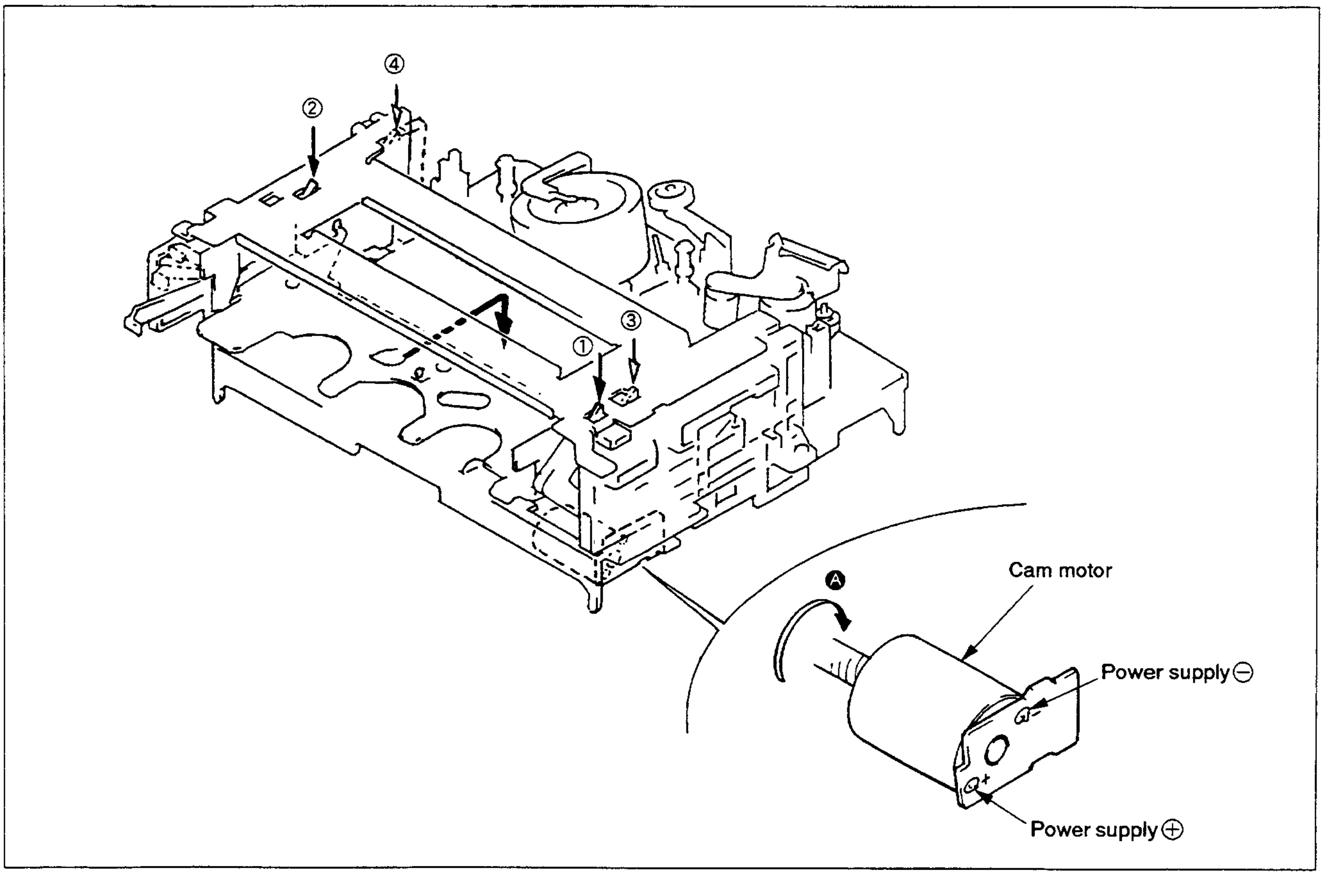


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF (Figs. 1-2 and 1-3)

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow 🅑 direction until unthreading is end.
2) Turn capstan motor in the arrow 🅒 direction to take up tape in cassette.
3) Turn cam motor in the arrow 🅑 direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +9 V (300 mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their original positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note: When unloading begins and cassette lid is closed, turn cam motor in the arrow 🅐 direction to open tape guard.

3) Turn capstan motor in the arrow 🅒 direction to take up tape in cassette.

Note: That tape is not caught at pinch roller. (Fig. 1-3)

4) Check that tape is not loosened completely, and apply approx. +9 V (300 mA) to contrary polarities of cam motor with regulated DC power supply. (Fig. 1-2)

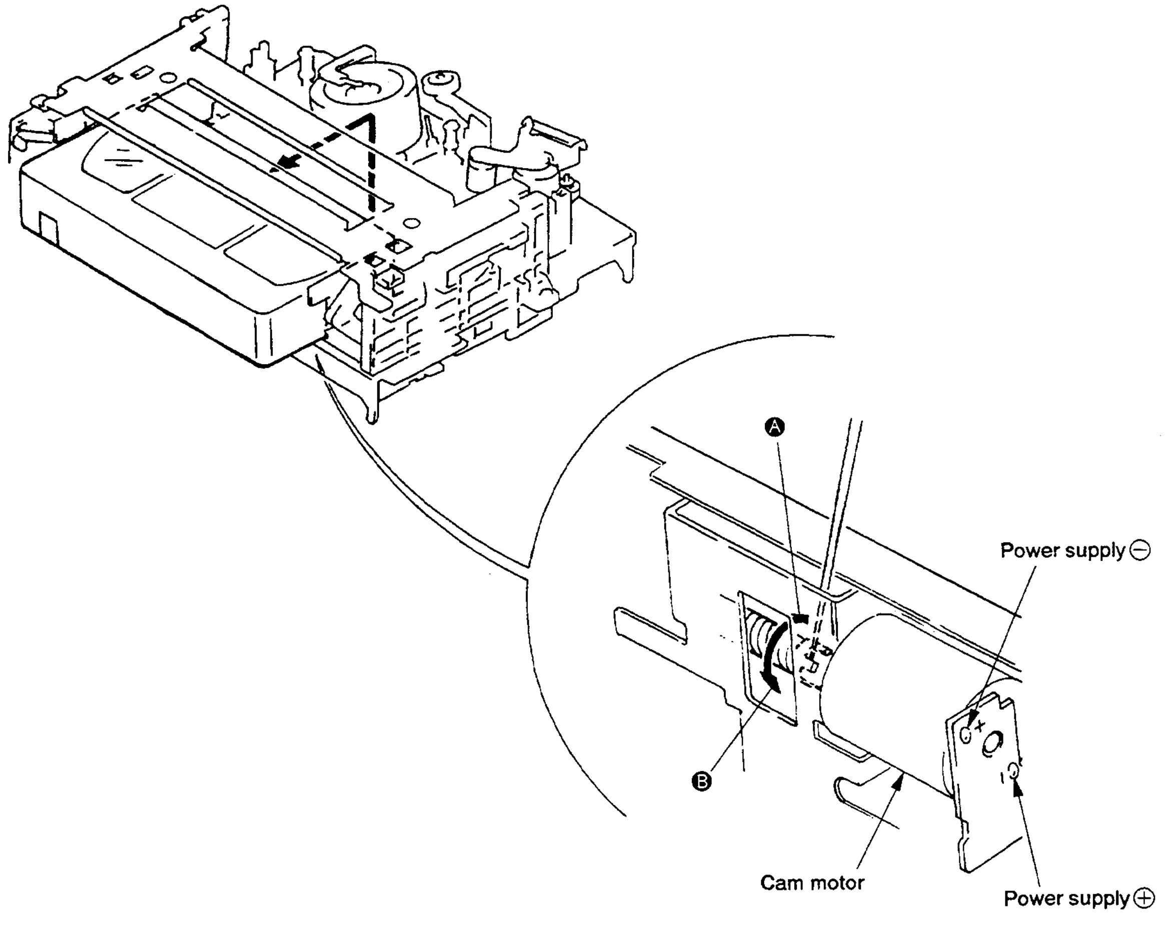


Fig. 1-2

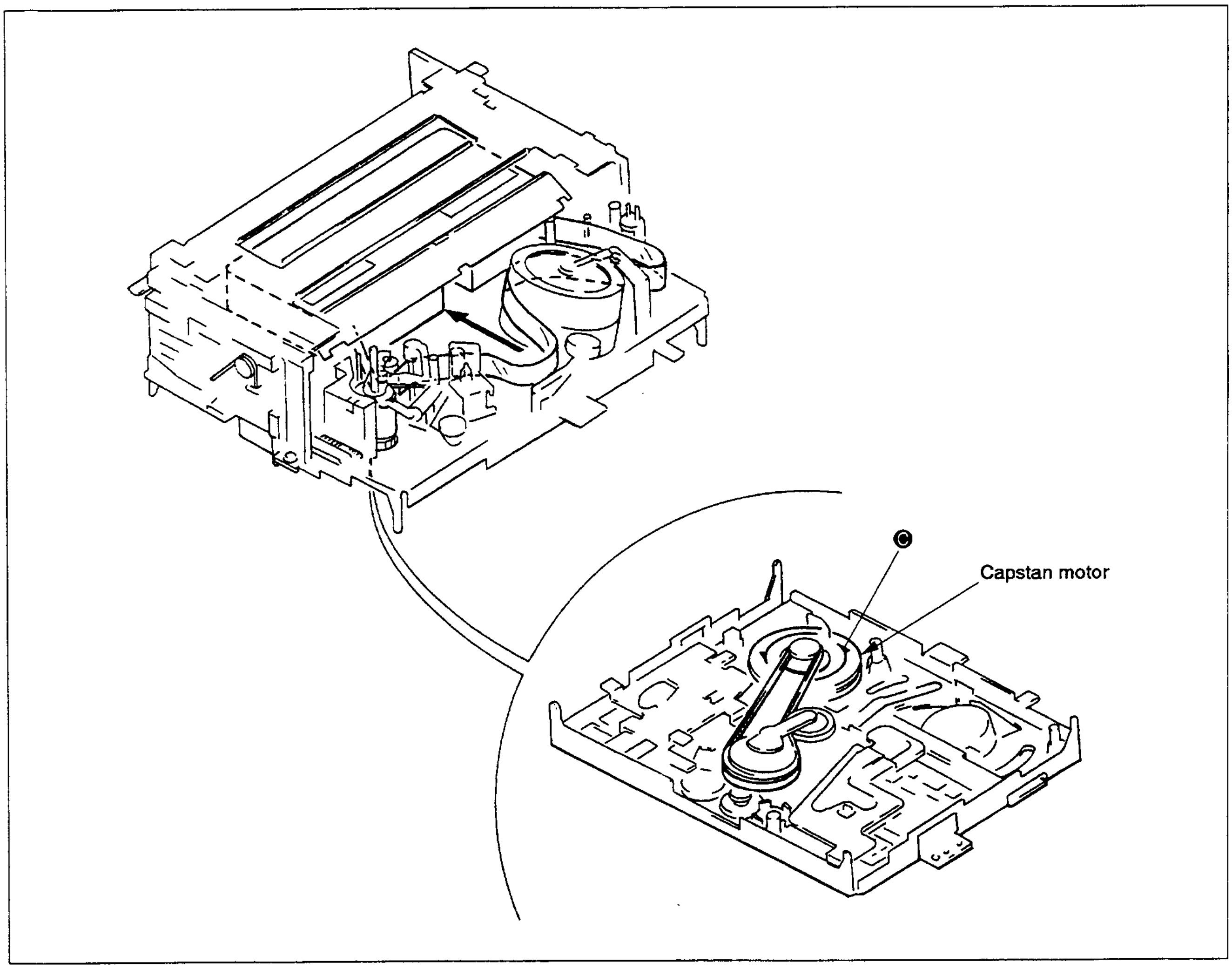

C
Capstan motor

Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT (Fig. 1-4)

Note 1: Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them. (Fig. A)

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape on the like.
3) Press cassette in/rec proof switch with a tip of screwdriver or the like.
4) Connect AC plug to wall outlet.
5) Release cassette in/rec proof switch by putting off a tip of screwdriver or the like.
   (At this time, power turns on, rewind operates for 10 seconds, after that power turns off.)

Note 2: In this condition, each mode can be set to video cassette recorder. (including recording mode)
However, fast forward should be done after rewinding for 15 seconds or more.

Note 3: After above mentioned operation, be sure to return the mode in the following order.

1) Remove the tape near the end and top sensors.
2) Pull out AC plug from wall outlet to reset the system control microcomputer.

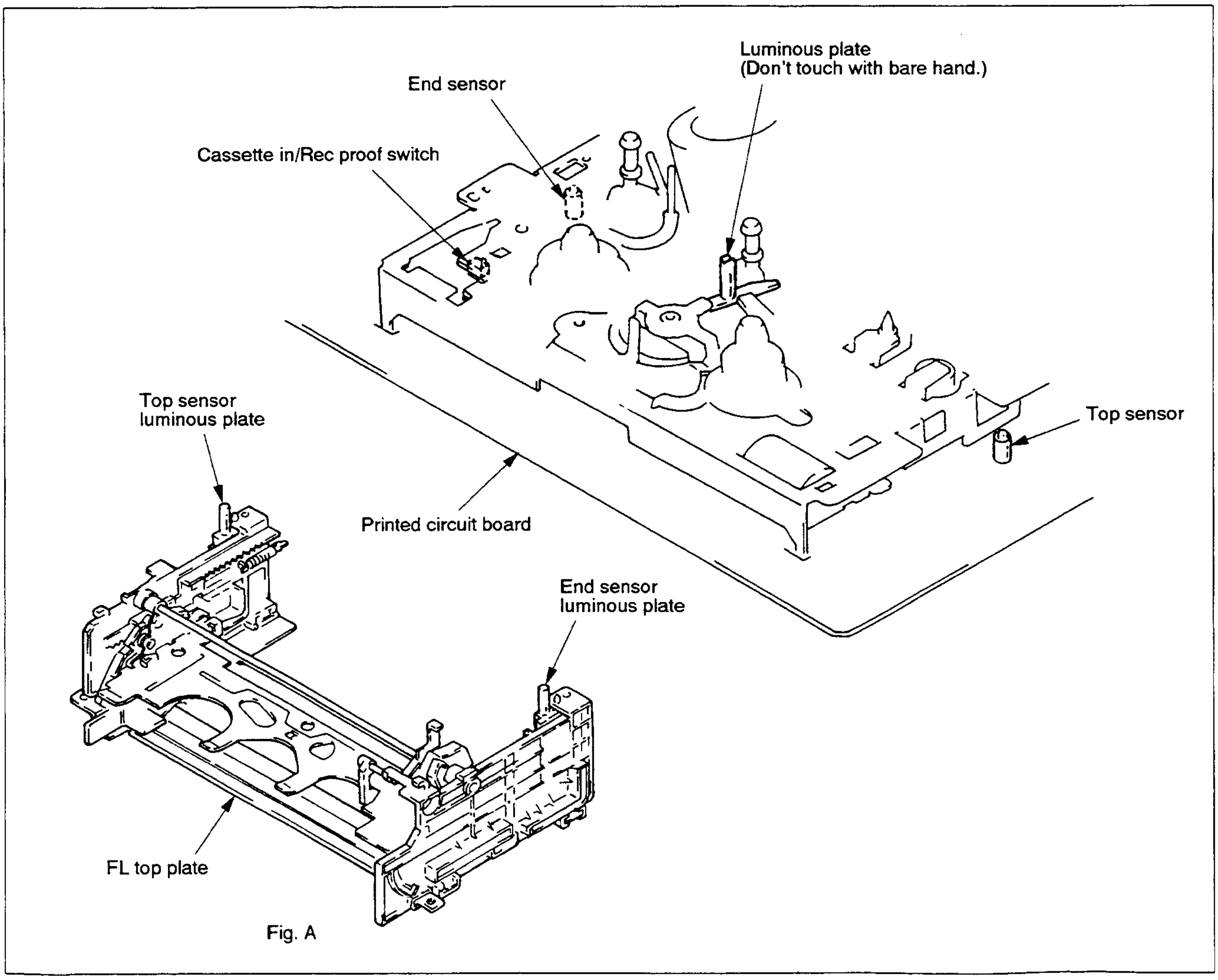

Luminous plate
(Don't touch with bare hand.)
End sensor
Cassette in/Rec proof switch
Top sensor luminous plate
Top sensor
Printed circuit board
End sensor luminous plate
FL top plate
Fig. A

Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

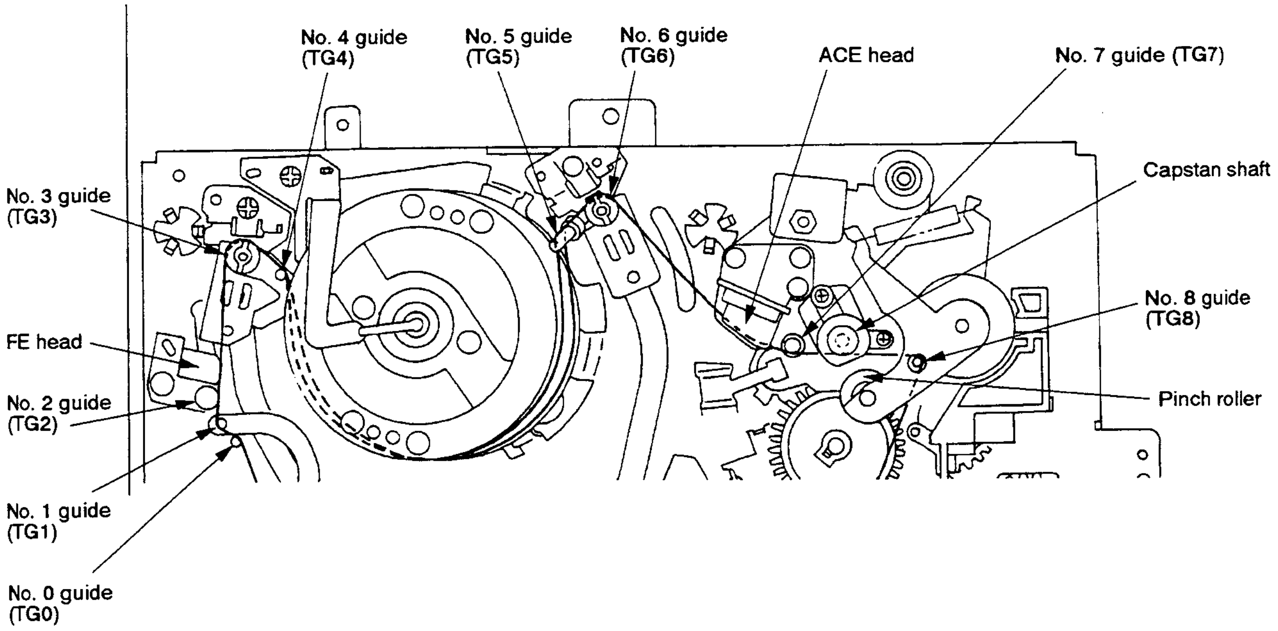

No. 4 guide (TG4)
No. 5 guide (TG5)
No. 6 guide (TG6)
ACE head
No. 7 guide (TG7)
Capstan shaft
No. 3 guide (TG3)
No. 8 guide (TG8)
FE head
No. 2 guide (TG2)
Pinch roller
No. 1 guide (TG1)
No. 0 guide (TG0)

Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

Operating Hours (H) Maintenance & Check		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to 4-1-1. Specified value: adjust to 36 to 44 g•cm (when measured with torque cassette tape)
	Confirmation of brake system	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section.
	Confirmation of record & playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 70 to 120 g•cm

○ Cleaning ☆ Confirmation

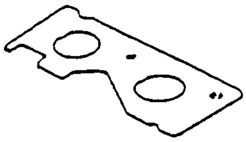
Note: On overhaul

When overhauling the unit, replace parts as indicated in the above table.

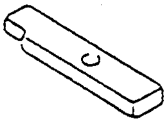
2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref No.	Name	Part No.	Carved Jig No.	Remarks
J-1	Master Plane	H-7099-279-H		Applicable to S-VHS
J-2	Reel Disk Height Jig	H-7099-038-H		
J-3	Torque Gauge Adaptor	H-7099-035-H		
J-4	0.93 mm Torque Gauge	H-7099-039-H		
J-5	Hex. Wrench	H-7099-202-H		
J-6	Torque Measurement Cassette VHT-063S	J-6082-011-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S	J-6082-012-A		For CUE and review torque measurement.
J-7	Alignment Tape JVC-MH-1 (NTSC) 24HASF-2 (NTSC Hi-Fi) JVC-MH-2 (PAL) JVC-MH-4 (SECAM)	 H-7099-046-H H-7099-153-H H-7099-052-H H-7099-053-H		
J-8	Cleaning Fluid	Y-2031-001-0	————	
J-9	Chamois Leather	2-034-697-00	————	
J-10	Head Demagnetizer	Widely available	————	Demagnetize video heads and audio heads.
J-11	Dental Mirror (With handle) Dental Mirror (Mirror)	J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-12	FLOIL SG-055G	7-651-000-09		
J-13	Diamond Oil NT-68	7-661-018-18		
J-14	Screw Lock G (1401B)	7-432-114-11		

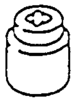
J-1



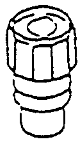
J-2



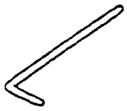
J-3



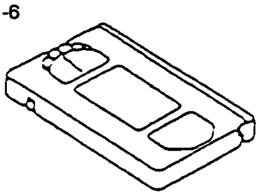
J-4



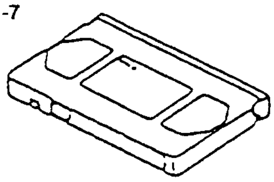
J-5



J-6



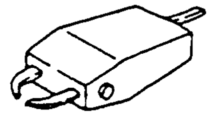
J-7



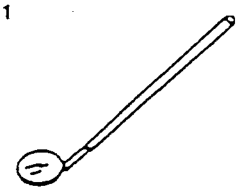
J-8

J-9

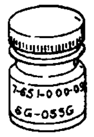
J-10



J-11

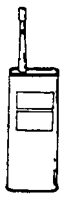


J-12



J-13

J-14



3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

- Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.
- On mounting, while referring to notes on mounting perform reversely in the removal order.
- When replacing greased parts, grease them in the same way.
- Do not oil, grease or touch with bare hands the surfaces contacts tape of guides and brake shoes.
- Install gears to engage each other.
- Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL BLOCK ASSEMBLY (Fig. 3-1)

1) Remove screws ①.
2) Remove FL block assembly ② in the arrow Ⓐ direction.

Note: Be careful not to damage claws on the bottom and front.

[Note on Mounting]

- First insert claws on the bottom and front not to damage.
- Engage FL slide plate to FL driving gear with slightly sliding FL slide plate. (Fig. A)
- Keep clean top sensor and end sensor luminous plates. (Refer to 1-3.)

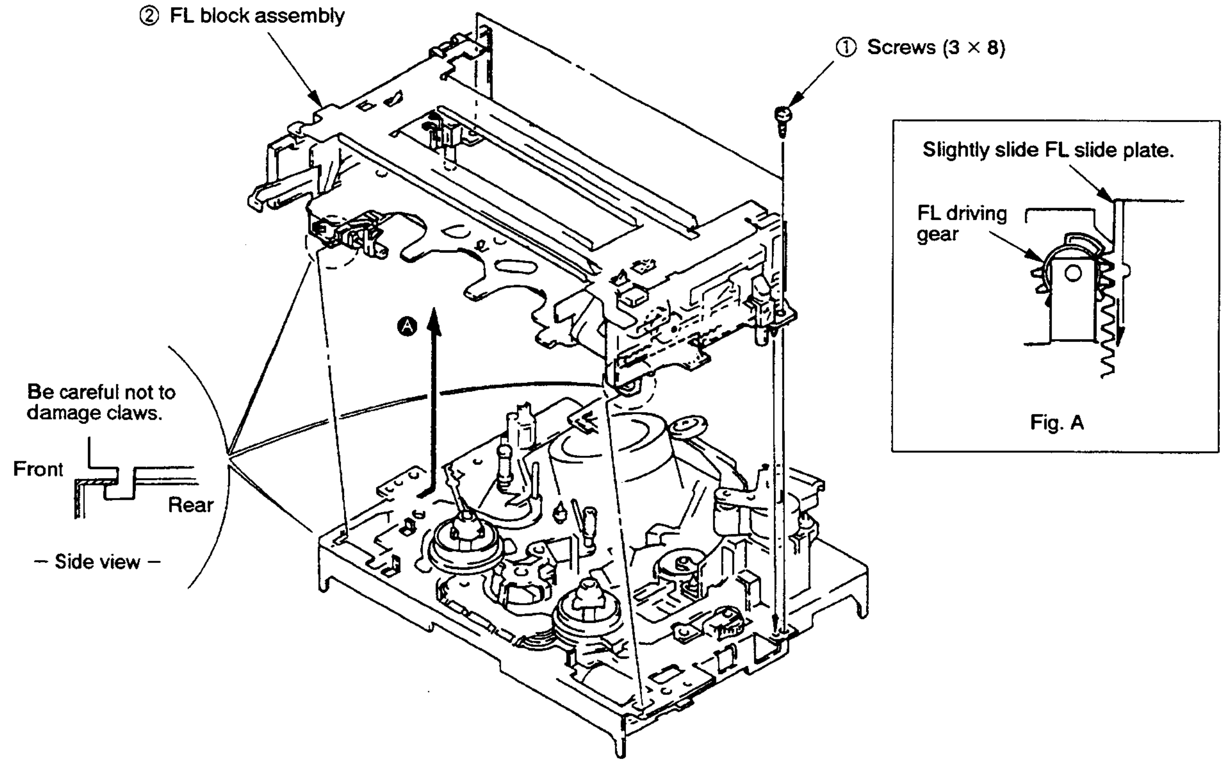

② FL block assembly
① Screws (3 × 8)
Ⓐ
Be careful not to damage claws.
Front
Rear
– Side view –
Slightly slide FL slide plate.
FL driving gear
Fig. A

Fig. 3-1

3-2. DRUM ASSEMBLY (Fig. 3-2)

1) Remove screw ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand or tools.
3) Remove screws ③ to remove drum assembly ④.

[Note on Mounting]

- Don't touch head chips ⑤ and ground shaft assembly ④ with bare hand or tools.
- Keep clean the surface contacts tape of drum assembly ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

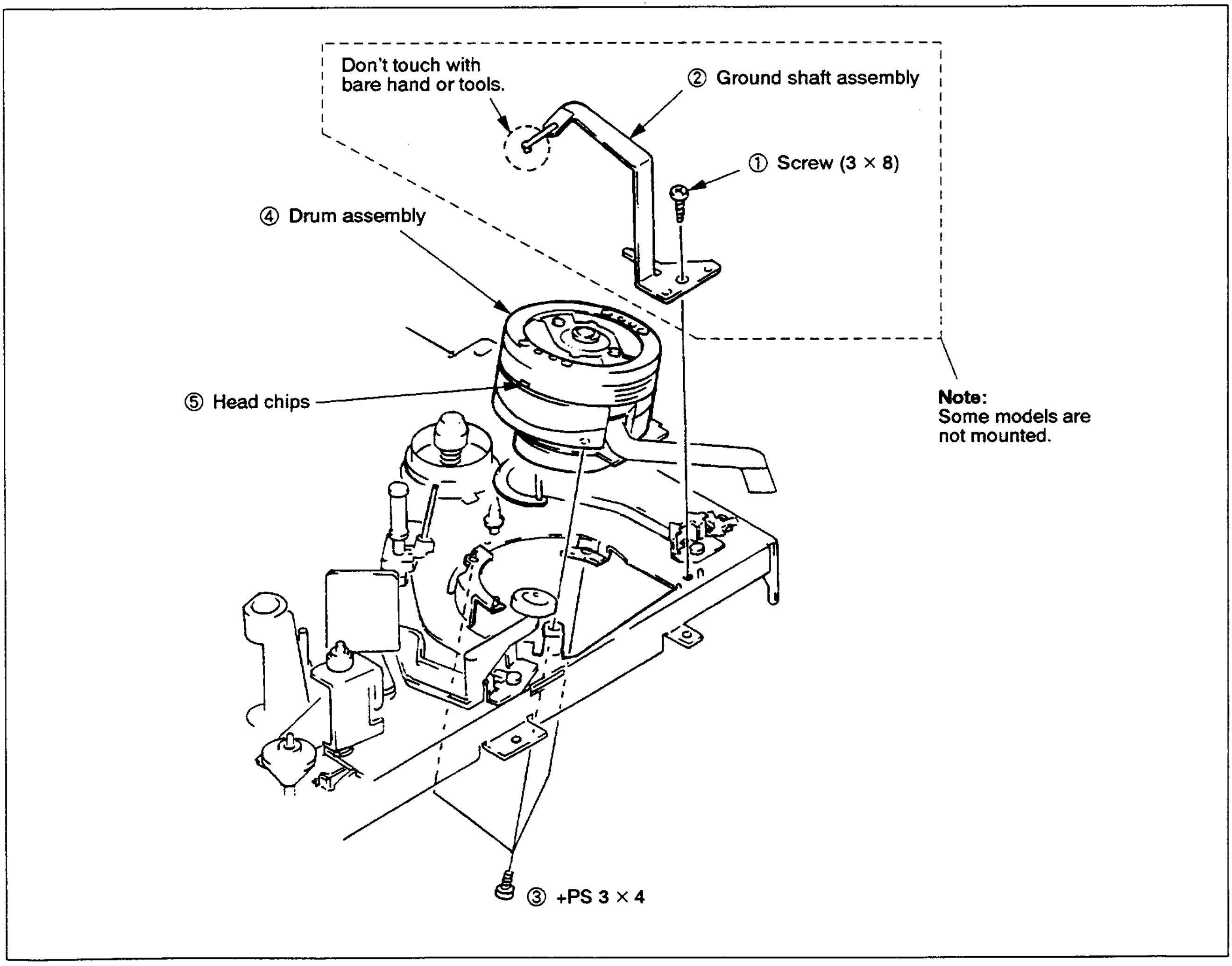

Don't touch with
bare hand or tools.
② Ground shaft assembly
① Screw (3 × 8)
④ Drum assembly
⑤ Head chips
Note:
Some models are
not mounted.
③ +PS 3 × 4

Fig. 3-2

3-3. TIMING BELT (Fig. 3-3)

1) Remove screw ① to remove tension vehicle arm assembly ②.
2) Remove timing belt ③.

[Note on Mounting]

- Tighten screw ① while pressing tension vehicle arm in the arrow Ⓐ direction.

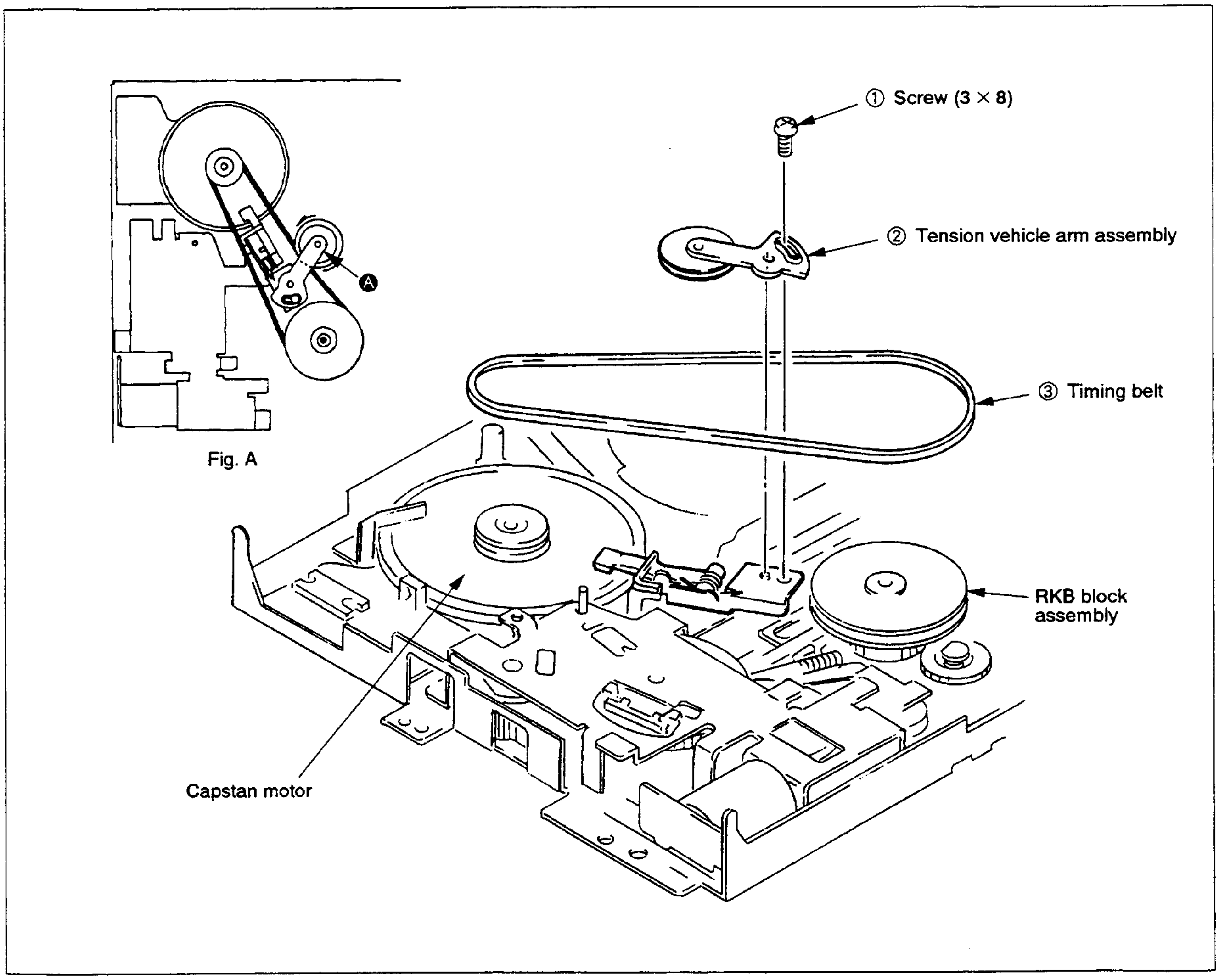


Fig. A
Ⓐ
① Screw (3 × 8)
② Tension vehicle arm assembly
③ Timing belt
RKB block assembly
Capstan motor

Fig. 3-3

3-4. CAP BRAKE ASSEMBLY (Fig. 3-4)

1) Remove tension vehicle arm assembly. (Refer to 3-3)
2) Remove torsion coil spring ① from portion Ⓐ to remove CAP brake assembly.

[Note on Mounting]

- Mount torsion coil spring ① to CAP brake assembly ② in the order Ⓐ and Ⓑ. (Fig. A)
- Put the fulcrum of CAP brake assembly ② to CAP brake shaft ③ and the tip of torsion coil spring to Ⓒ.
- Don't touch brake shoe Ⓓ with bare hand.

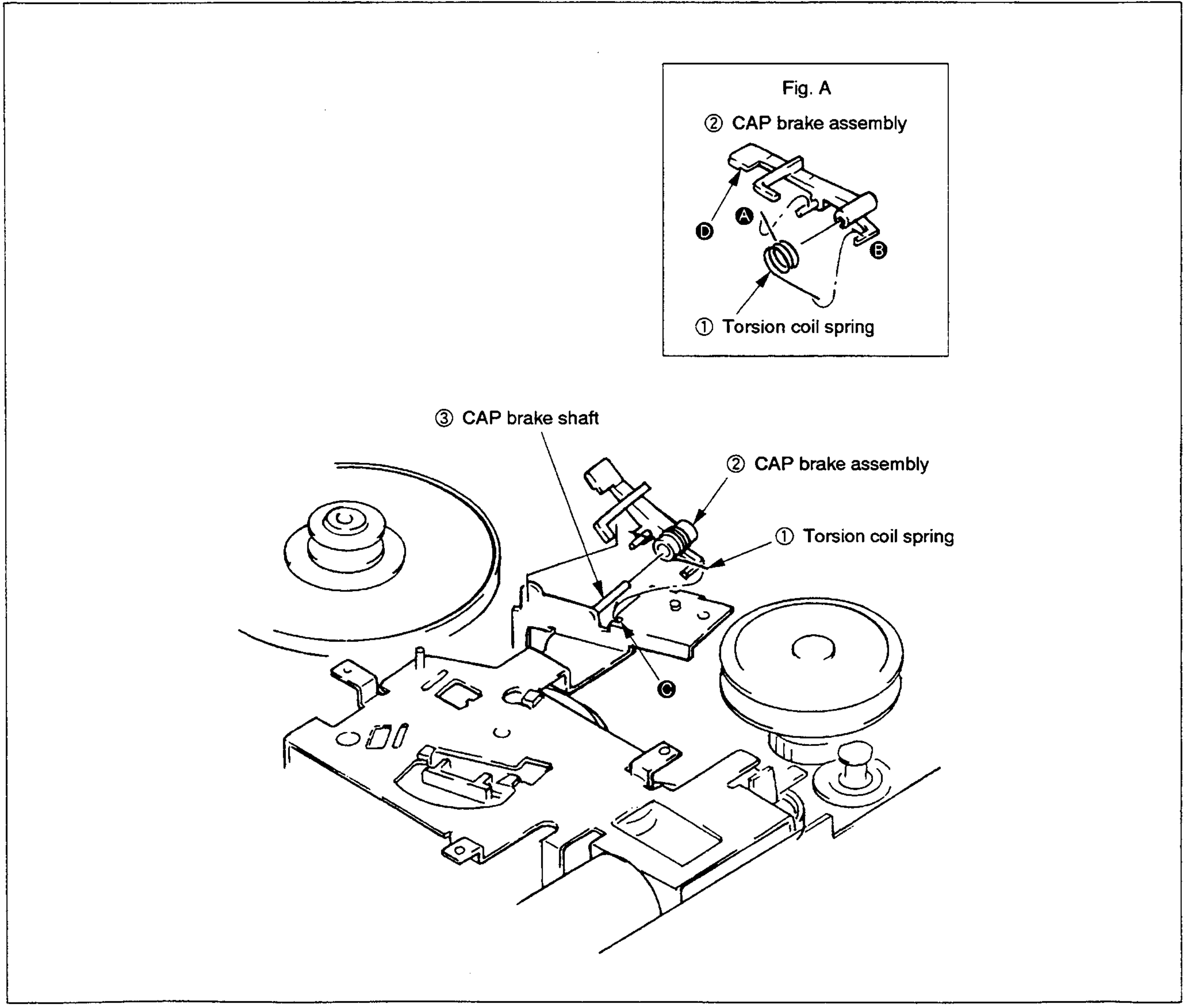


Fig. A
② CAP brake assembly
Ⓓ
Ⓐ
Ⓑ
① Torsion coil spring
③ CAP brake shaft
② CAP brake assembly
① Torsion coil spring
Ⓒ

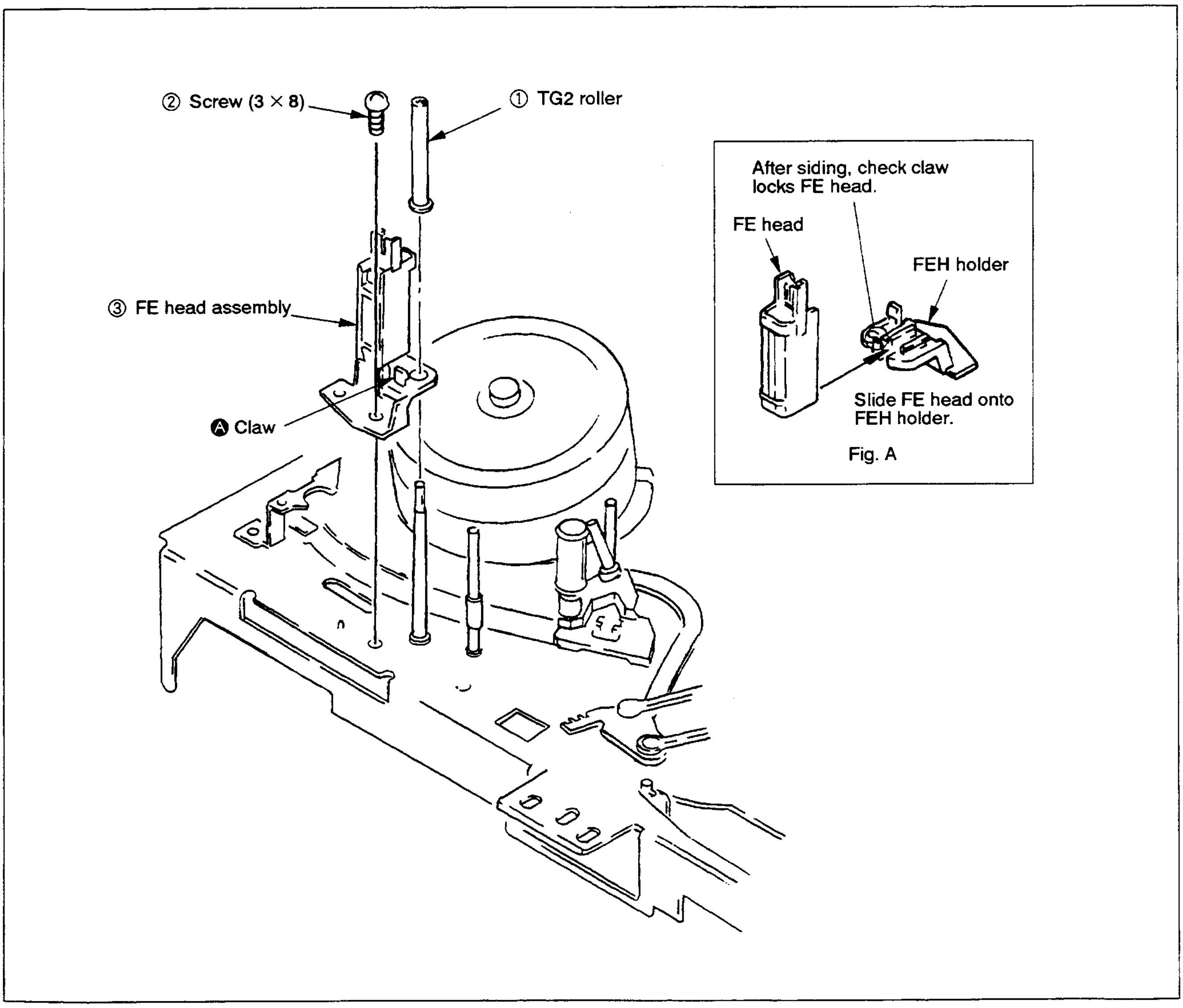
Fig. 3-4

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove claw Ⓐ to pull out TG2 roller ①.
2) Remove screw ② to pull out FE head assembly.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller ①.


② Screw (3 × 8)
① TG2 roller
③ FE head assembly
Ⓐ Claw
FE head
FEH holder

After siding, check claw locks FE head.

Slide FE head onto FEH holder.

Fig. A

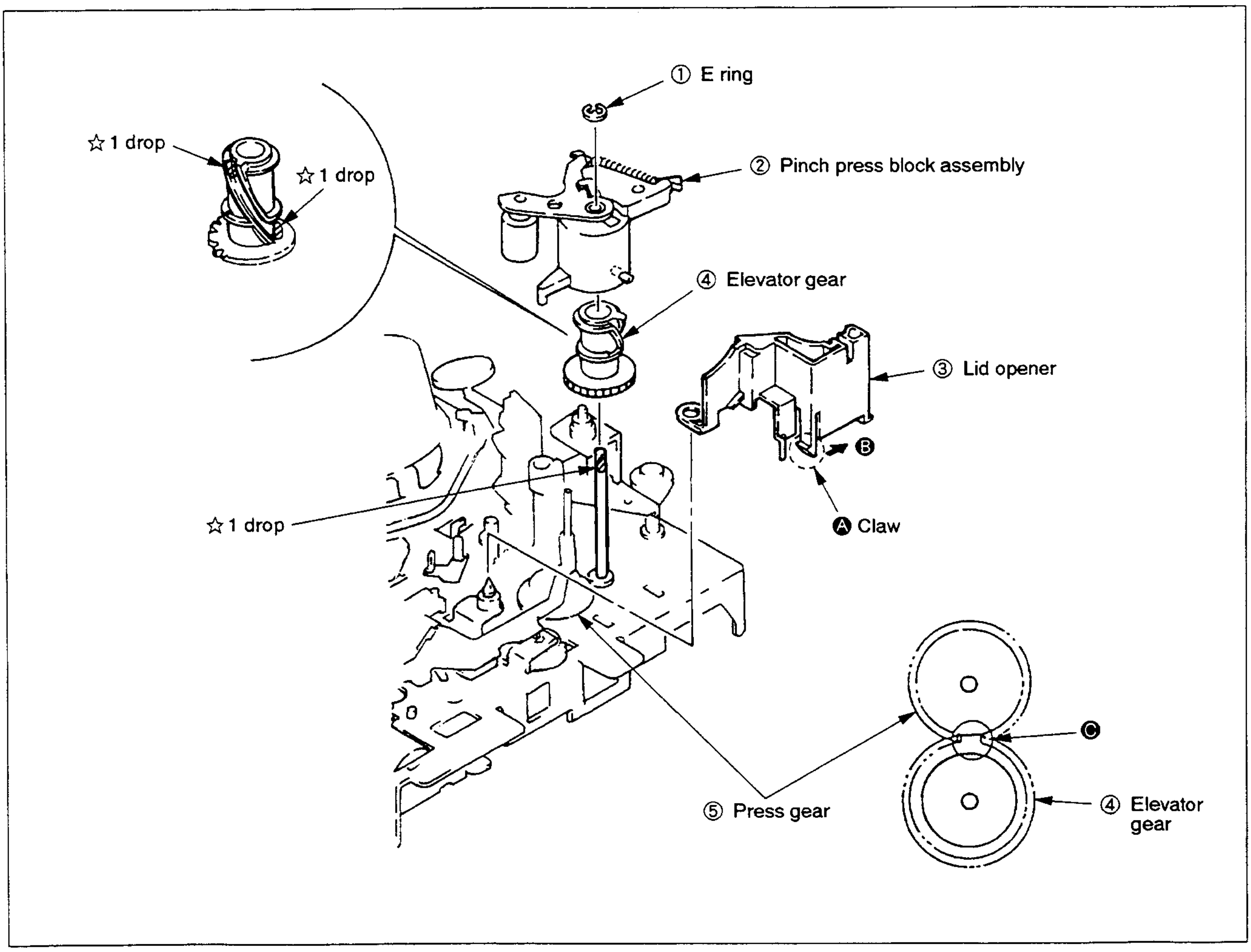
Fig. 3-5

3-6. PINCH PRESS BLOCK ASSEMBLY, ELEVATOR GEAR (Fig. 3-6)

1) Remove E ring ① to pull out pinch press block assembly ②.
2) Remove lid opener ③ by pressing claw Ⓐ in the arrow Ⓑ direction.
3) Pull out elevator gear ④.

[Note on Mounting]

- Apply grease FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.
- Be sure to match the phase Ⓒ between elevator gear ④ and press gear ⑤ on mounting elevator gear ④.



① E ring
☆1 drop
☆1 drop
② Pinch press block assembly
④ Elevator gear
③ Lid opener
Ⓑ
Ⓐ Claw
☆1 drop
Ⓒ
⑤ Press gear
④ Elevator gear

Fig. 3-6

3-7. ACE BLOCK ASSEMBLY (Fig. 3-7)

1) Move torsion coil spring (ACE) ① in the arrow Ⓐ direction.
2) Remove ACE adjustment screw ②.
3) Remove AC height adjustment nut ③ to pull out ACE block assembly ④.

[Note on Mounting]

- Keep clean the surface contacts tape of ACE block assembly ④.
- Be sure to hang torsion coil spring (ACE) ① in the arrow Ⓑ direction.
- Set ACE adjustment screw ② to the height as shown in Fig. A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.
- After adjustment apply Screw Lock G (1401B) (Jig Ref. No. J-14) at ☆ marked portion.

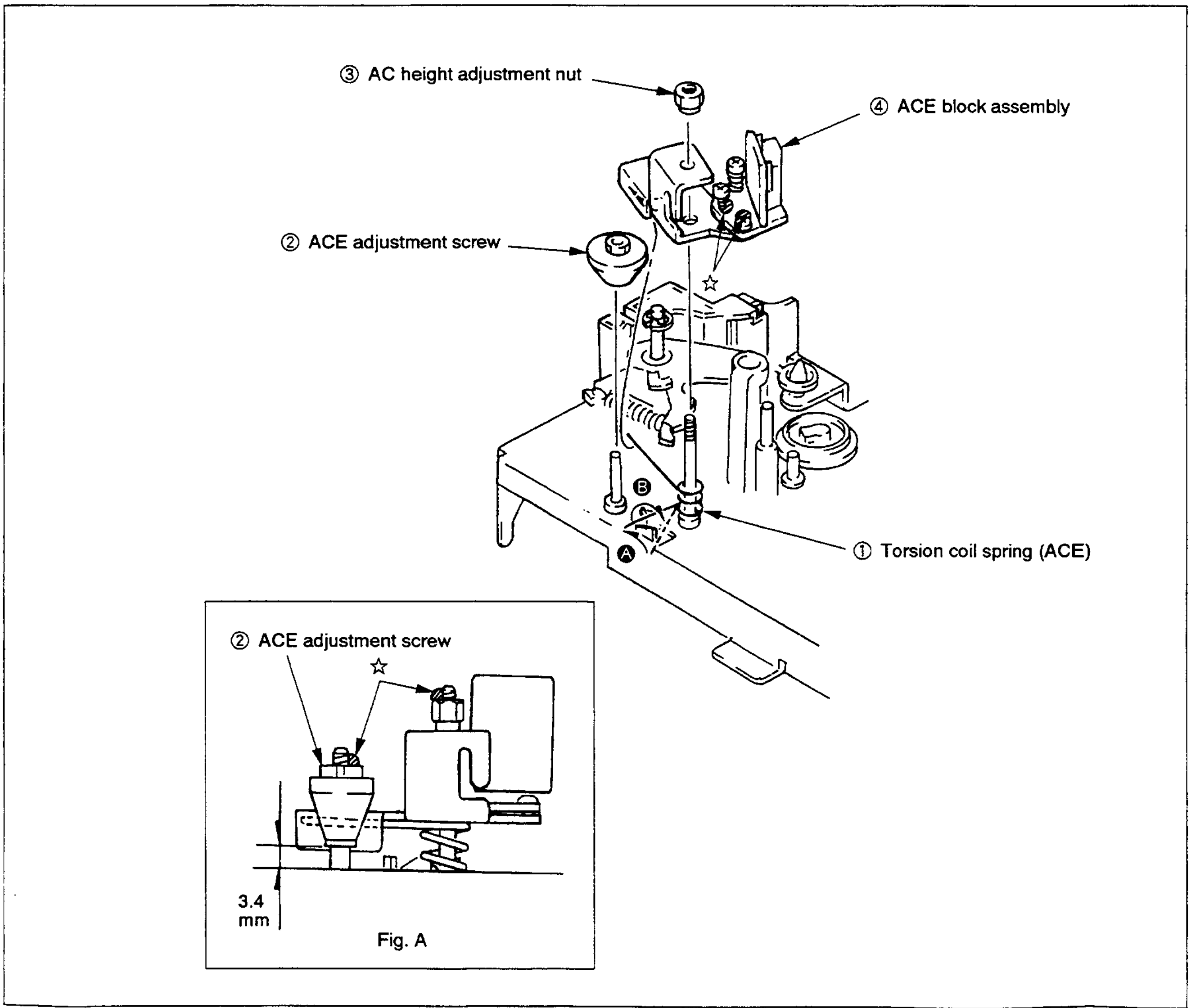

③ AC height adjustment nut
④ ACE block assembly
② ACE adjustment screw
☆
Ⓑ
Ⓐ
① Torsion coil spring (ACE)
② ACE adjustment screw
☆
3.4 mm
Fig. A

Fig. 3-7

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) Loosen screw ① and pull out. TG3 guide roller assembly ② by turning it in the arrow Ⓐ direction.
2) Loosen screw ③ and pull out TG6 guide roller assembly ④ by turning it in the arrow Ⓑ direction.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ②, ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

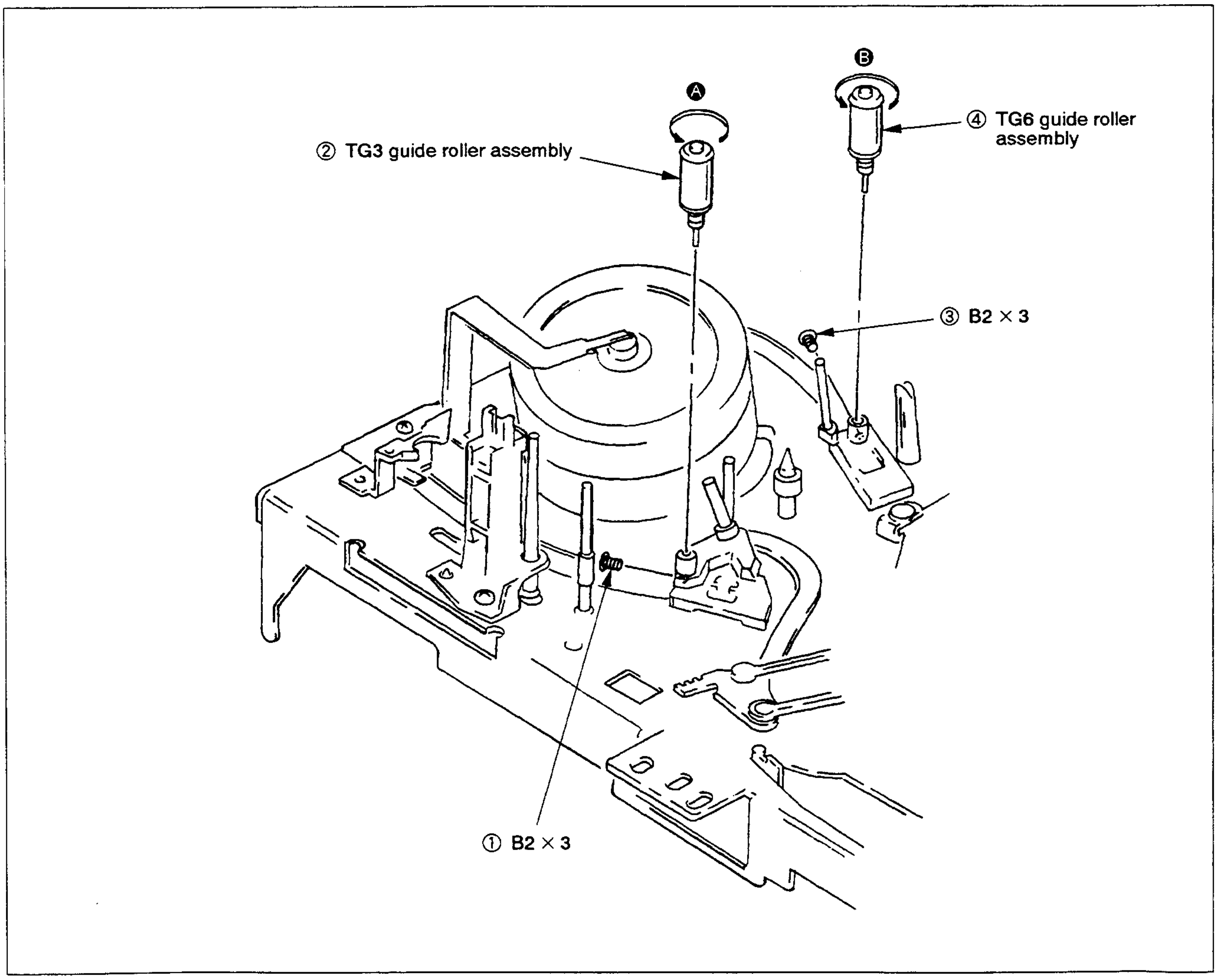
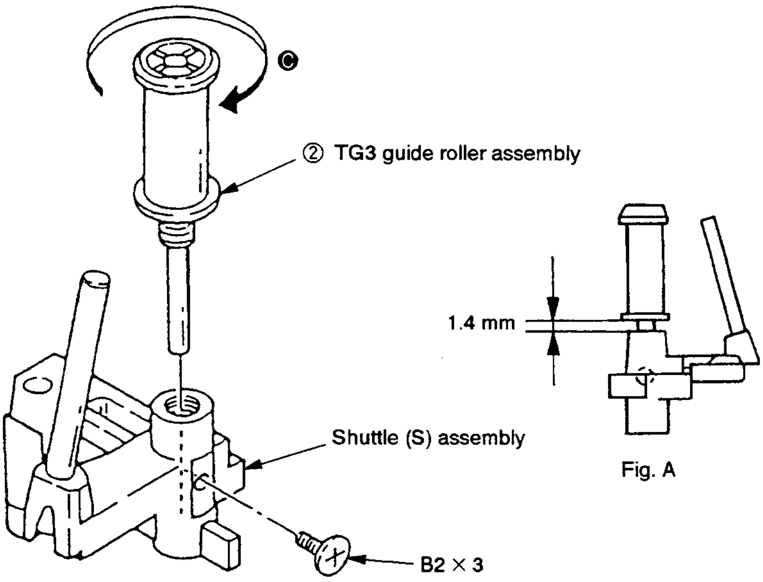
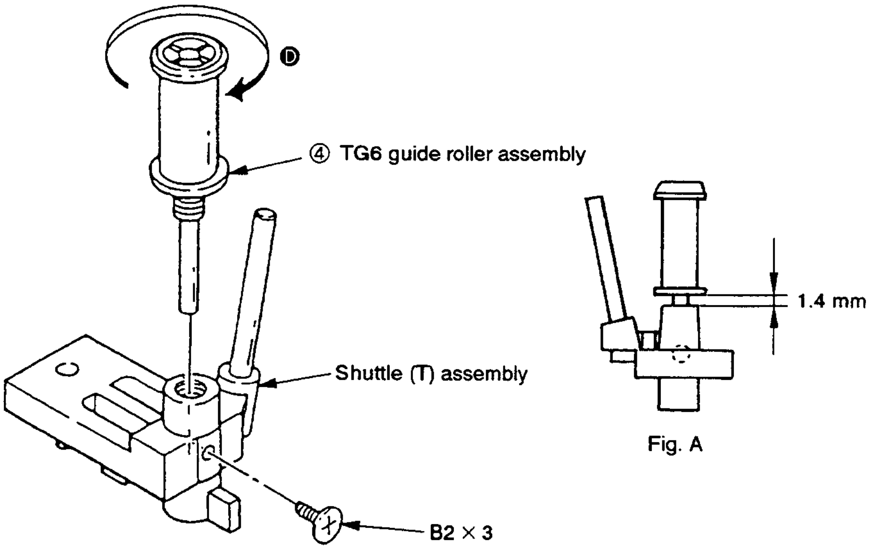

Ⓑ
Ⓐ
④ TG6 guide roller assembly
② TG3 guide roller assembly
③ B2 × 3
① B2 × 3

Fig. 3-8



Ⓒ
② TG3 guide roller assembly
1.4 mm
Shuttle (S) assembly
Fig. A
B2 × 3

Fig. 3-9



Ⓓ
④ TG6 guide roller assembly
1.4 mm
Shuttle (T) assembly
Fig. A
B2 × 3

Fig. 3-10

3-9. CAPSTAN MOTOR (Fig. 3-11)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to pull out capstan motor ②.

[Note on Mounting]

- Keep clean the surface contacts tape of capstan motor ②.
- On tightening screws ①, first tighten screw A temporarily, next tighten screws in the order B to C to A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

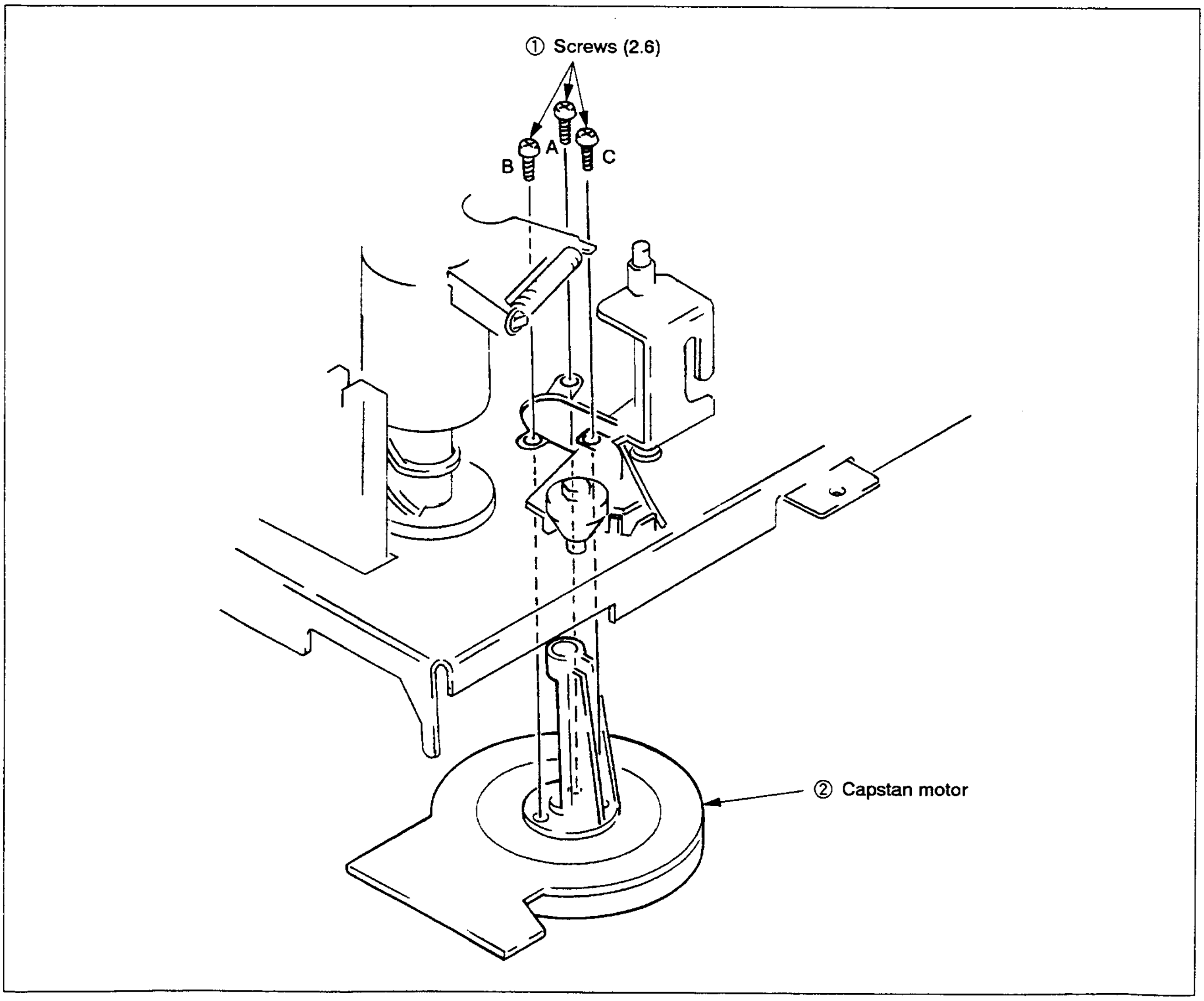


Fig. 3-11

3-10. MAIN BRAKE ASSEMBLIES S AND T (Fig. 3-12)

1) Remove tension spring ①.
2) Remove stopper washer (2) ② to remove neutrality arm ③.
3) Remove pendulum compulsion arm ④ and tension coil spring ⑤.
4) Remove stopper washer (2) ⑥ to remove main brake S assembly ⑦.
5) Remove stopper washer (2) ⑧ to remove main brake T assembly ⑨.

[Note on Mounting]

- Don't touch brake shoes Ⓐ and Ⓑ with bare hand.
- Apply FLOIL FG-055G (Jig Ref. No. J-12) to ☆ marked portions.

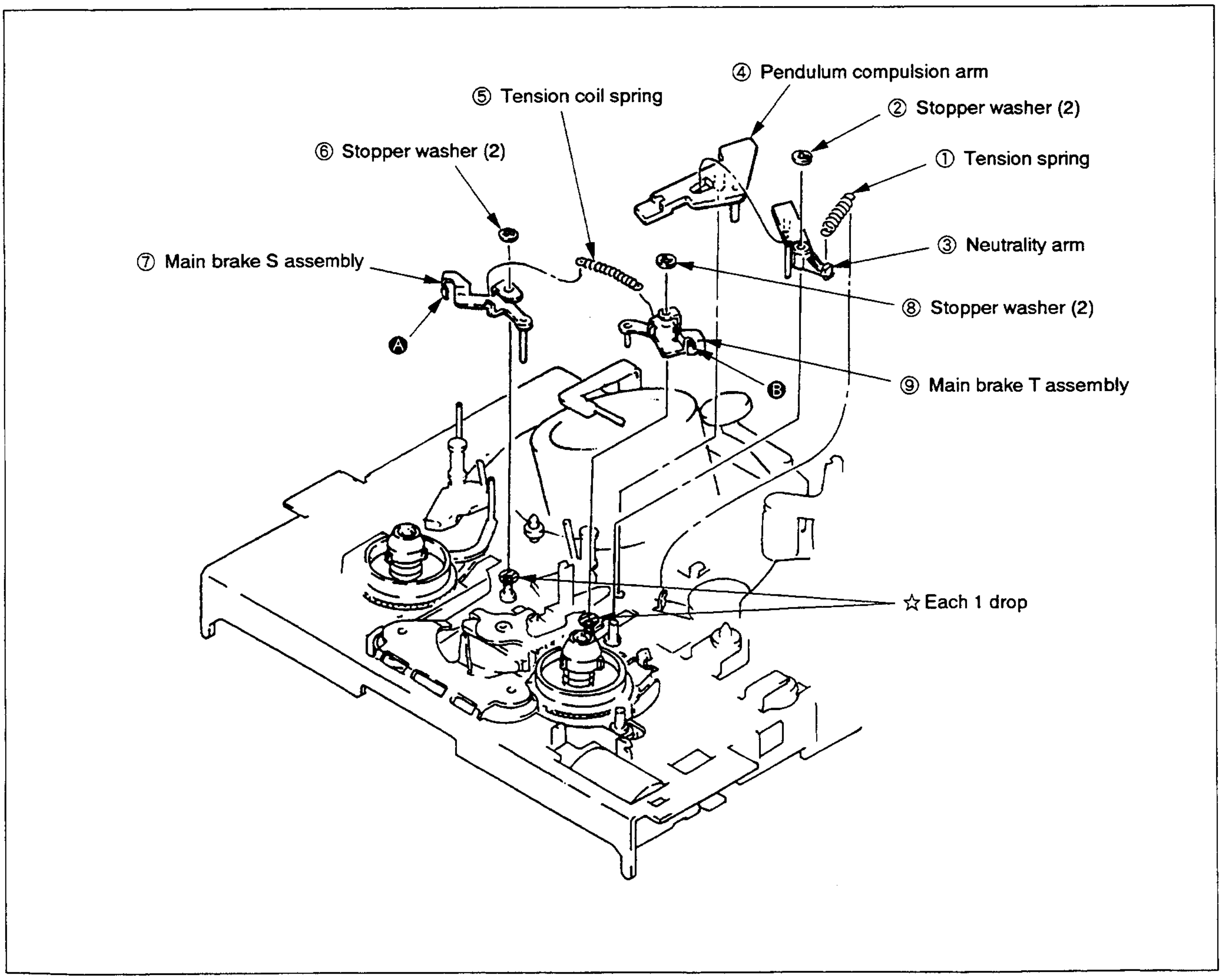

④ Pendulum compulsion arm
⑤ Tension coil spring
② Stopper washer (2)
⑥ Stopper washer (2)
① Tension spring
⑦ Main brake S assembly
③ Neutrality arm
⑧ Stopper washer (2)
Ⓐ
Ⓑ
⑨ Main brake T assembly
☆Each 1 drop

Fig. 3-12

3-11. SOFT BRAKE T ASSEMBLY (Fig. 3-13)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove lid opener ① carefully not to damage claw 🅐.
3) Remove tension spring ② from side 🅑 to pull out soft brake T assembly ③.

[Note on Mounting]

- Don't touch brake shoes 🅒 with bare hand.

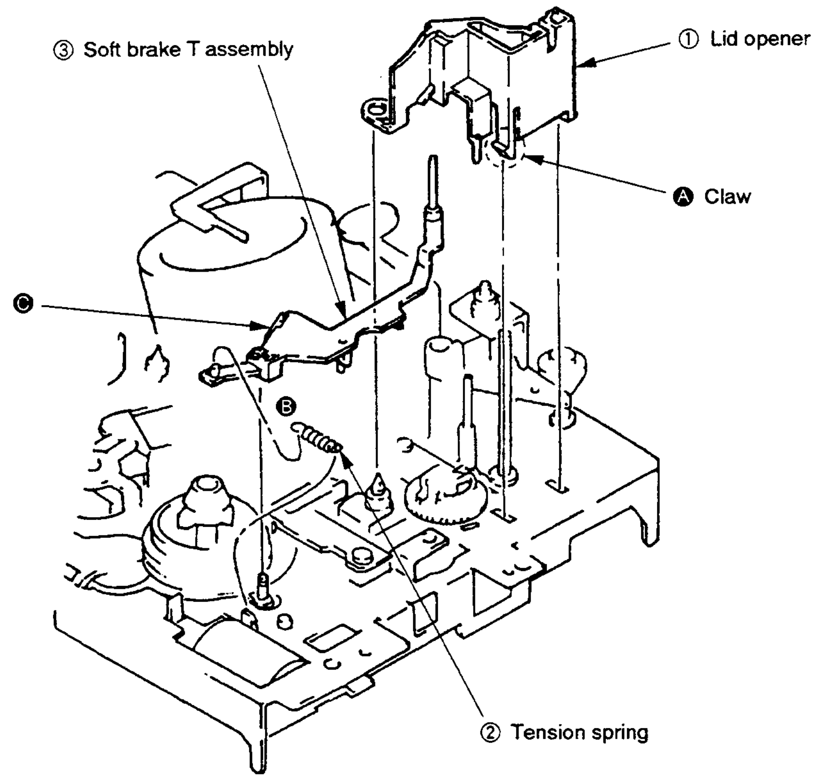

③ Soft brake T assembly
① Lid opener
🅐 Claw
🅒
🅑
② Tension spring

Fig. 3-13

3-12. RVS BRAKE ARM ASSEMBLY, REEL TABLE (T) ASSEMBLY (Fig. 3-14)

1) Remove main brake T assembly. (Refer to 3-10.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove tension coil spring ① in the order 🅐 to 🅑.
4) Remove RVS brake arm assembly ②.
5) Remove stopper washer (2) ③ to pull out reel table (T) assembly ④.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (T) assembly ④. (Fig. A)
- Don't touch the hatched portion on reel table (T) assembly ④ and brake shoe 🅒 of RVS brake arm assembly ② with bare hand.

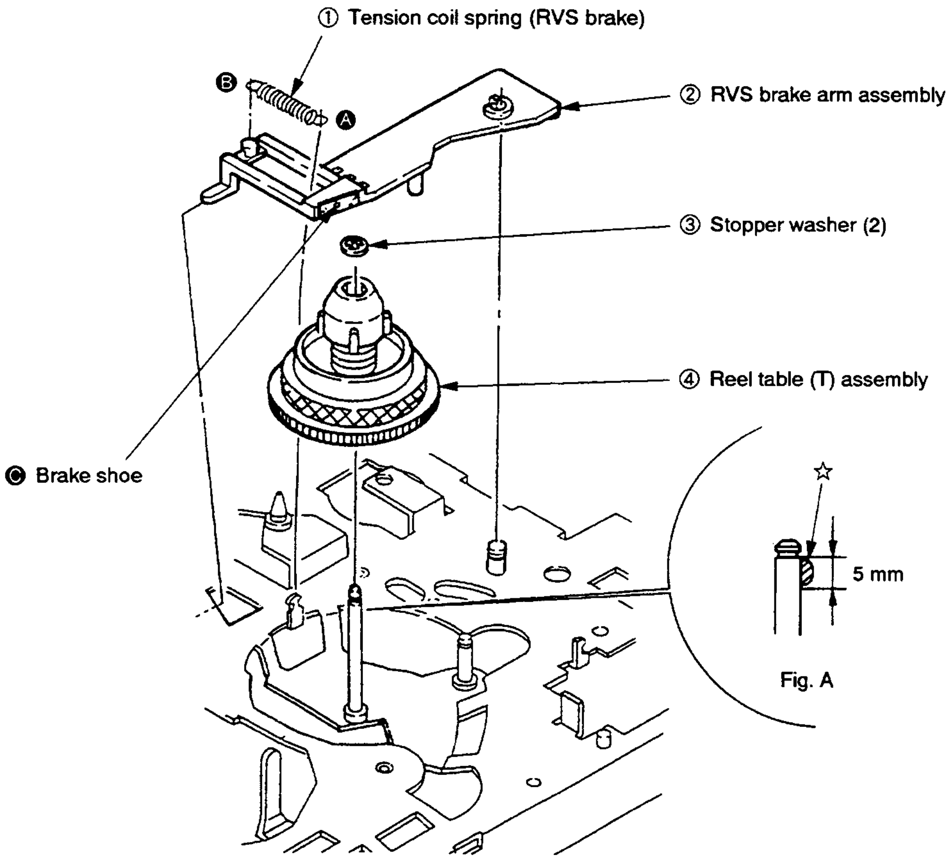

① Tension coil spring (RVS brake)
🅑
🅐
② RVS brake arm assembly
③ Stopper washer (2)
④ Reel table (T) assembly
🅒 Brake shoe
☆
5 mm
Fig. A

Fig. 3-14

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG8 retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG8 retainer ①.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

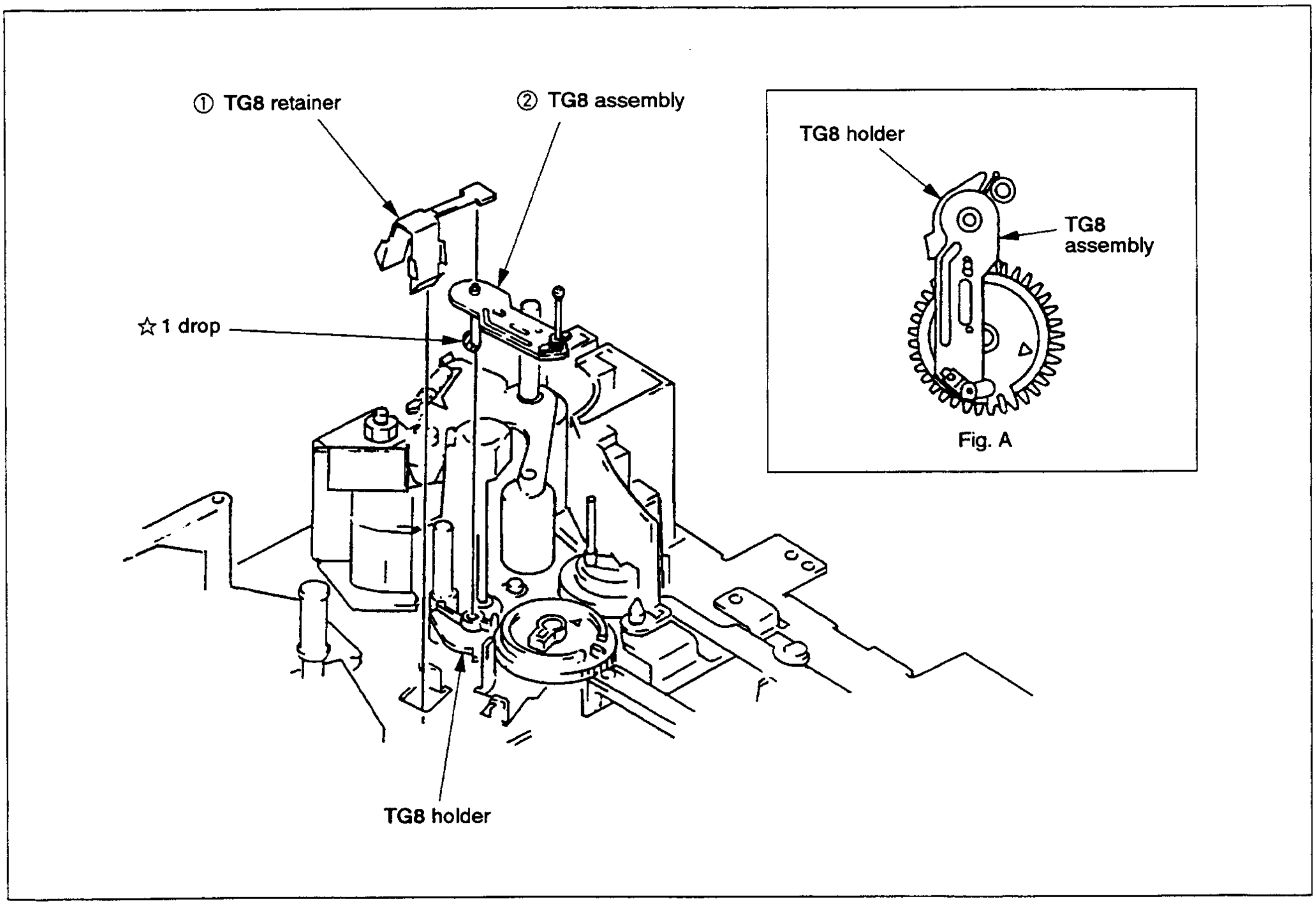

① TG8 retainer
② TG8 assembly
☆1 drop
TG8 holder
TG8 holder
TG8 assembly
Fig. A

Fig. 3-15

3-14. TG8 HOLDER (Fig. 3-16)

1) Remove TG8 assembly. (Refer to 3-13)
2) Pull out TG8 holder ①.

[Note on Mounting]

- Be careful about the direction of TG8 holder ①. (Ⓐ of Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

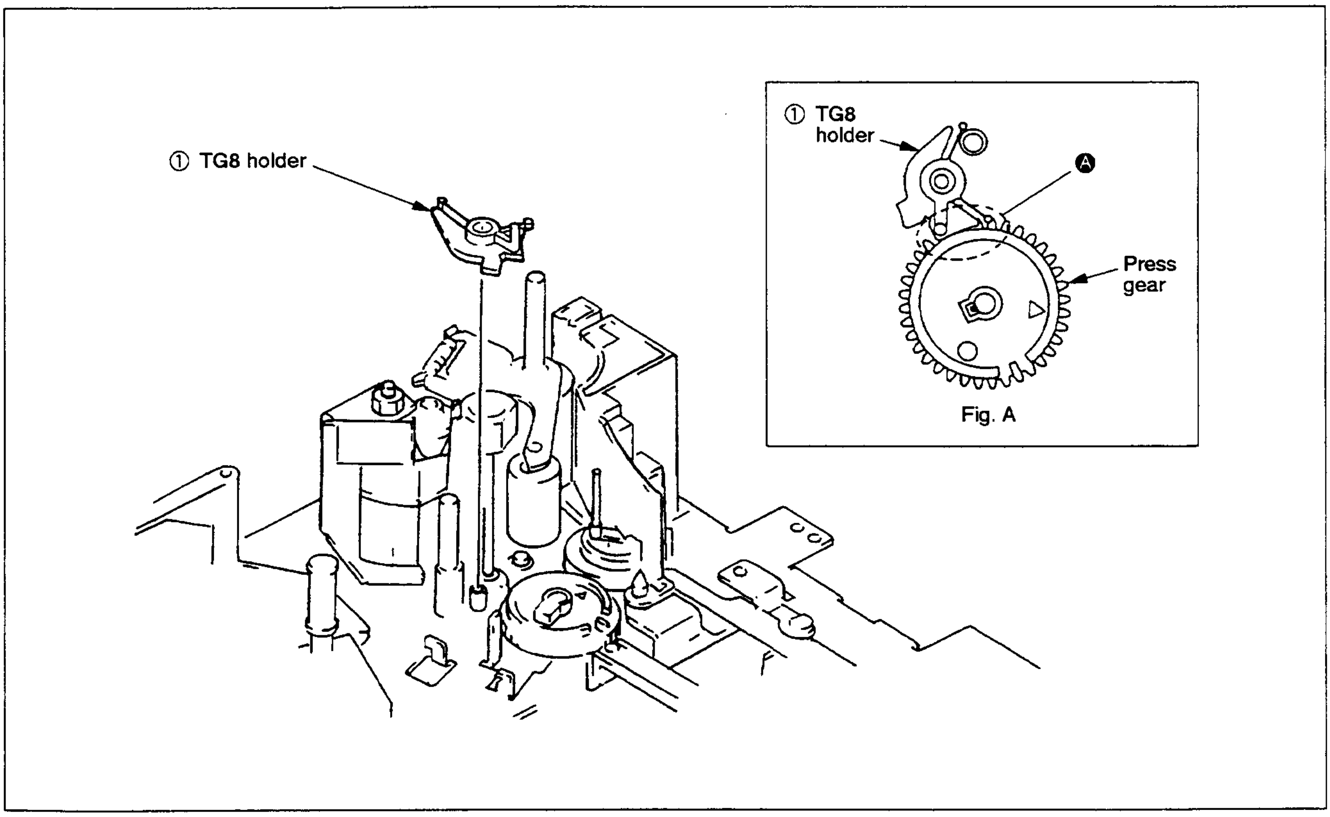

① TG8 holder
① TG8 holder
Ⓐ
Press gear
Fig. A

Fig. 3-16

3-15. TG8 AND PRESS GEARS (Fig. 3-17)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove TG8 assembly. (Refer to 3-13.)
4) Remove TG8 holder. (Refer to 3-14.)
5) Pull out TG8 gear ① or press gear ②.

[Note on Mounting]

- Adjust the holes on gears to the holes on chassis. (Fig. A)
- Adjust the arrows carved on gears each other. (Fig. A)

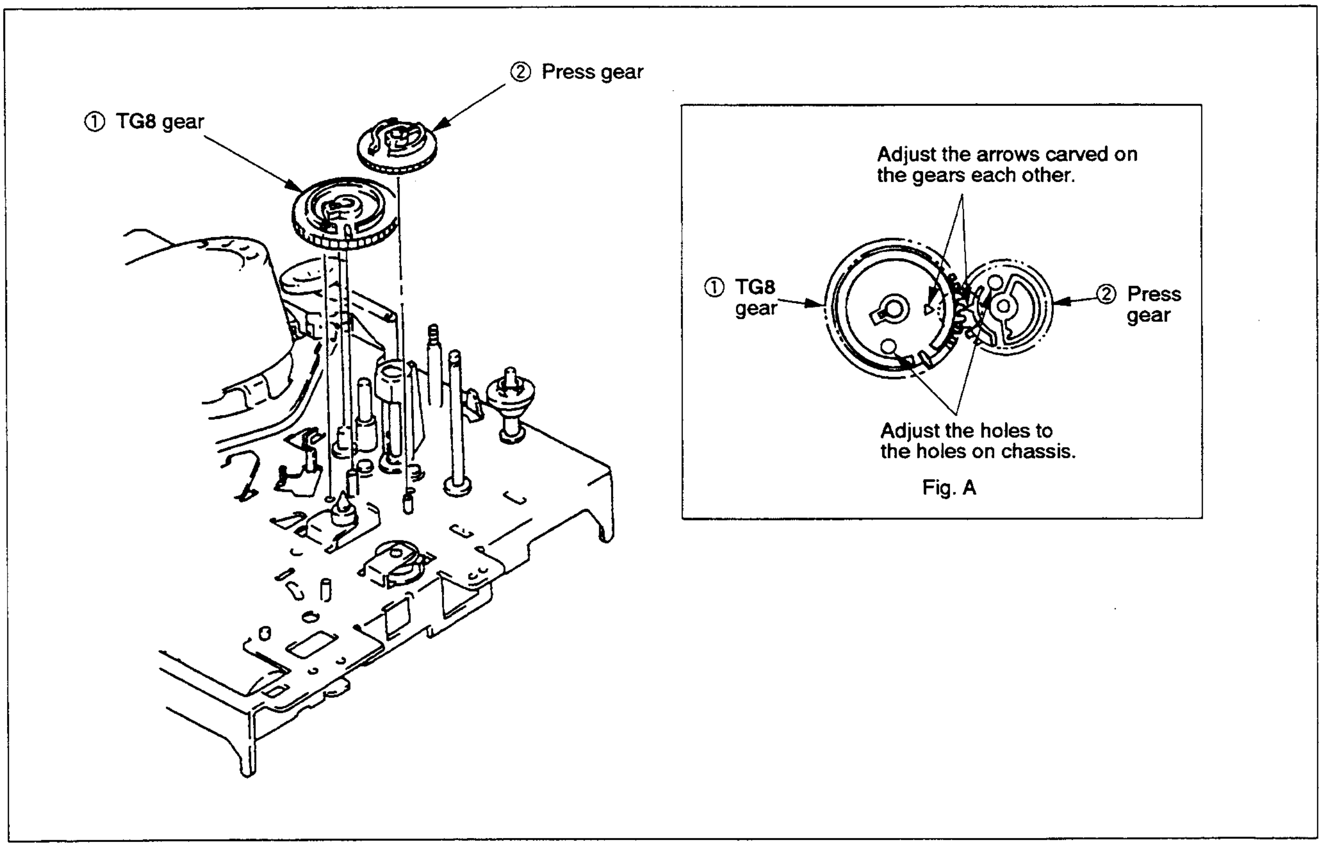

② Press gear
① TG8 gear
Adjust the arrows carved on the gears each other.
① TG8 gear
② Press gear
Adjust the holes to the holes on chassis.
Fig. A

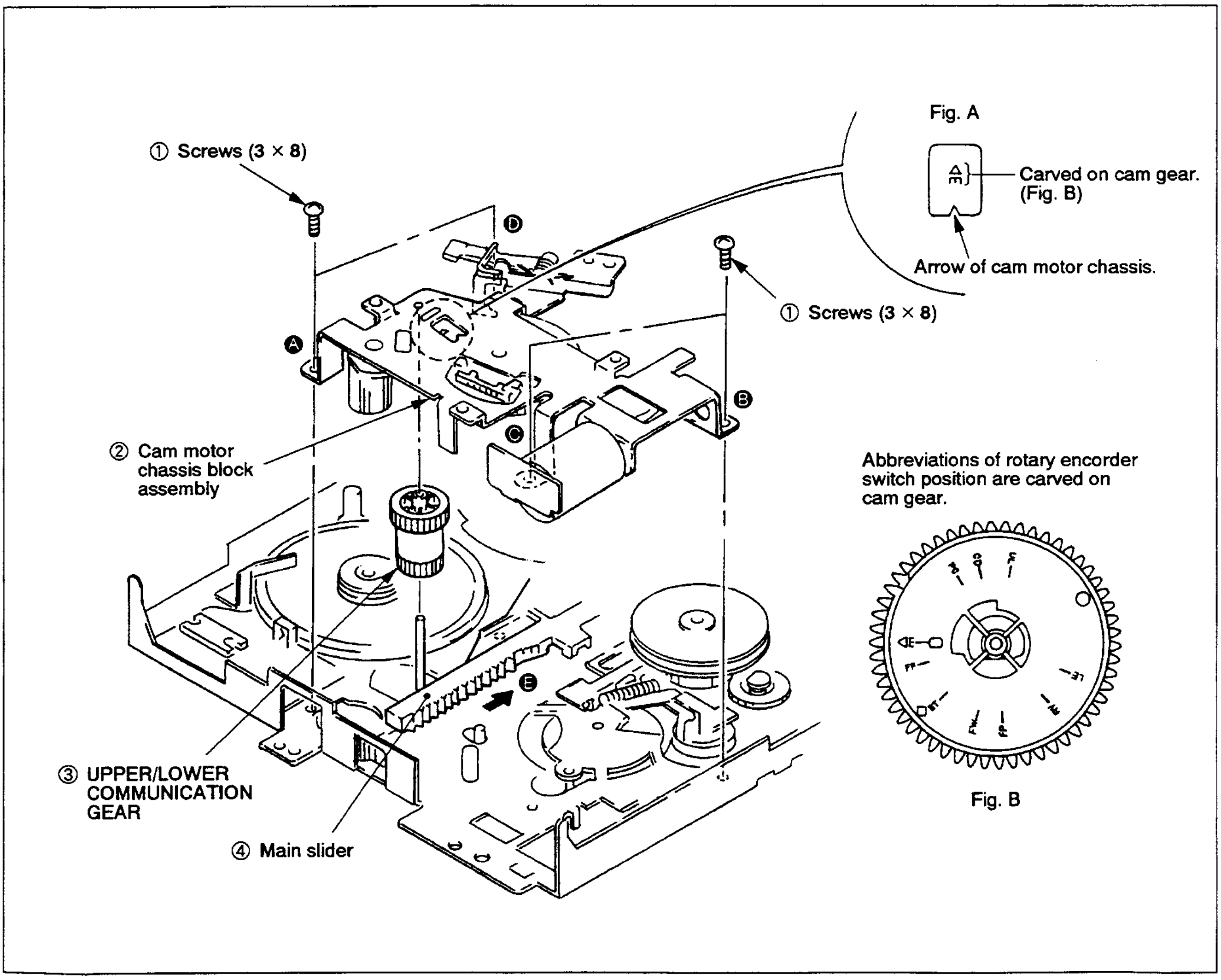
Fig. 3-17

3-16. CAM MOTOR CHASSIS BLOCK ASSEMBLY, UPPER/LOWER COMMUNICATION GEAR (Fig. 3-18)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to remove cam motor chassis assembly ②.
4) Pull out upper/lower communication gear ③.

[Note on Mounting]

- First, check main slider ④ slides fully in the arrow Ⓔ direction.
- Set rotary encoder switch position to "E" seen from the window of cam motor chassis. (Fig. A)
- Tighten screws ① in the order Ⓐ to Ⓑ to Ⓒ to Ⓓ.



① Screws (3 × 8)
Ⓓ
Ⓐ
Ⓑ
Ⓒ
Ⓔ
① Screws (3 × 8)
② Cam motor chassis block assembly
③ UPPER/LOWER COMMUNICATION GEAR
④ Main slider
Fig. A
Carved on cam gear. (Fig. B)
Arrow of cam motor chassis.
Abbreviations of rotary encorder switch position are carved on cam gear.
Fig. B

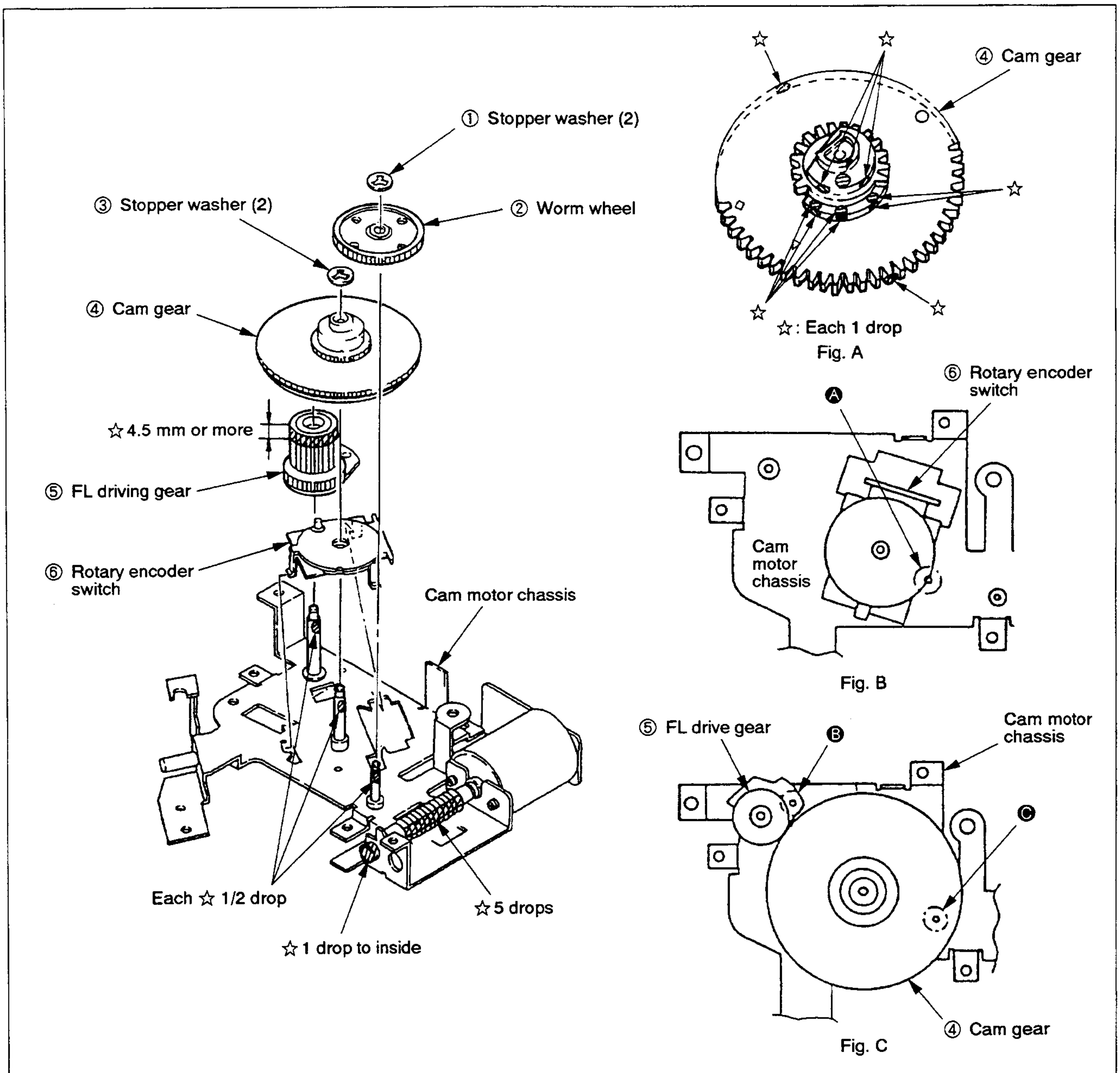
Fig. 3-18

3-17. ROTARY ENCODER SWITCH (Fig. 3-19)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly (Refer to 3-15.) and turn upside on the bottom.
4) Remove stopper washer (2) ① to pull out worm wheel ②.
5) Remove stopper washer (2) ③ to pull out cam gear ④.
6) Pull out FL driving gear ⑤ and rotary encoder switch ⑥.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions. (Fig. 3-19, A)
- Adjust the hole 🅐 to the hole on cam motor chassis. (Fig. B)
- Adjust the holes 🅑 and 🅒 to the hole on cam motor chassis. (Fig. C)



① Stopper washer (2)
③ Stopper washer (2)
② Worm wheel
④ Cam gear
☆4.5 mm or more
⑤ FL driving gear
⑥ Rotary encoder switch
Cam motor chassis
Each ☆ 1/2 drop
☆5 drops
☆1 drop to inside
☆
☆
④ Cam gear
☆
☆
☆
☆: Each 1 drop
Fig. A
⑥ Rotary encoder switch
🅐
Cam motor chassis
Fig. B
⑤ FL drive gear
🅑
Cam motor chassis
🅒
④ Cam gear
Fig. C

Fig. 3-19

3-18. MAIN SLIDER (Fig. 3-20)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove screw ① to remove retainer ②.
5) Pull out main slider ③.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) as shown in Fig. A.
- At the last, slide main slider fully in the arrow 🅐 direction.

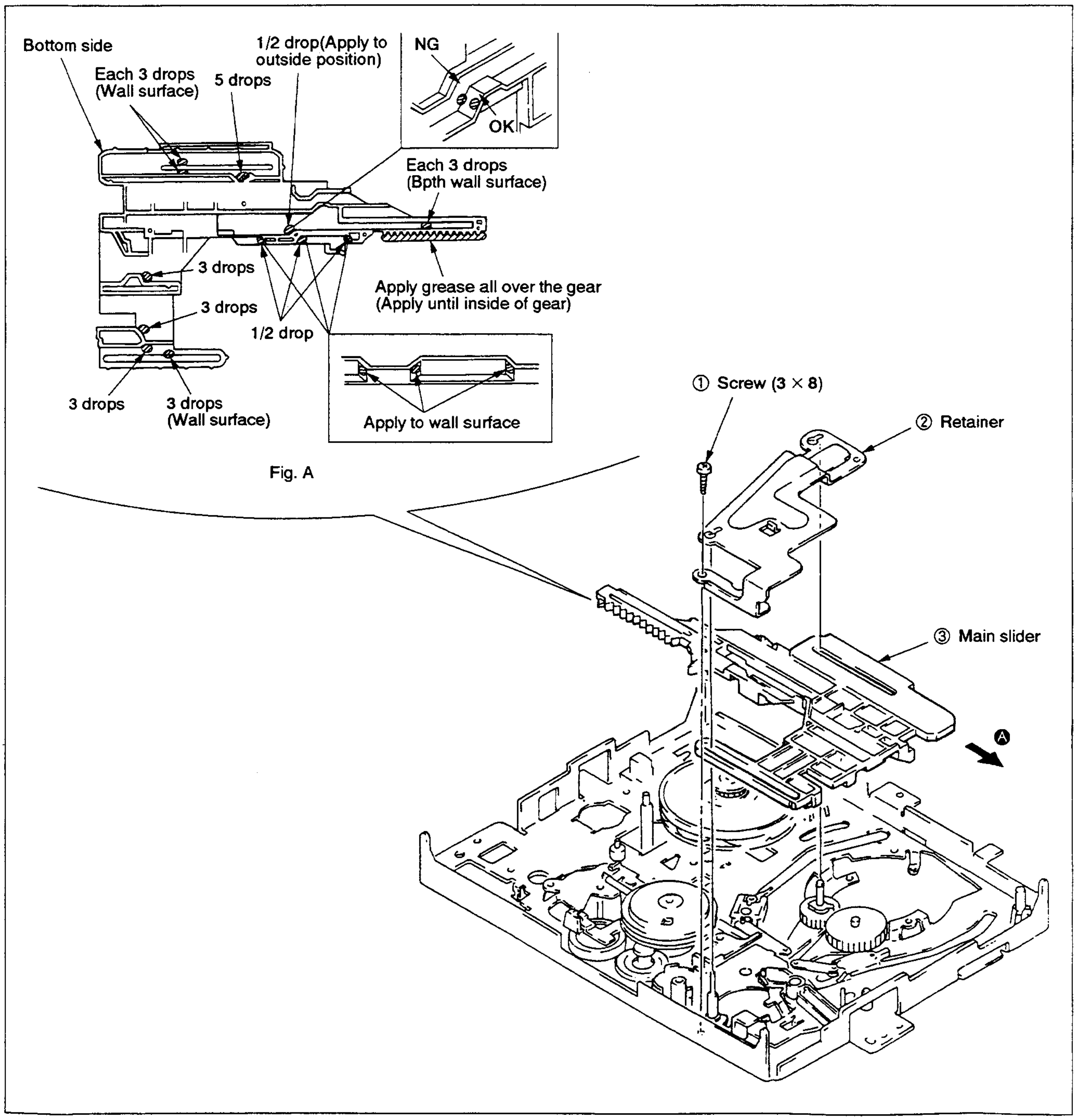

Bottom side
1/2 drop(Apply to outside position)
Each 3 drops (Wall surface)
5 drops
NG
OK
Each 3 drops (Bpth wall surface)
3 drops
3 drops
1/2 drop
Apply grease all over the gear (Apply until inside of gear)
3 drops
3 drops (Wall surface)
Apply to wall surface
Fig. A
① Screw (3 × 8)
② Retainer
③ Main slider
🅐

Fig. 3-20

3-19. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Fig. 3-21)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove screw ① to remove loading leaf (T) spring ② and shuttle T block assembly ③.
6) Pull out loading gear T block assembly ④.

[Note on Mounting]

- Adjust the phase 🅐 between loading gear (T) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle T block assembly ③.

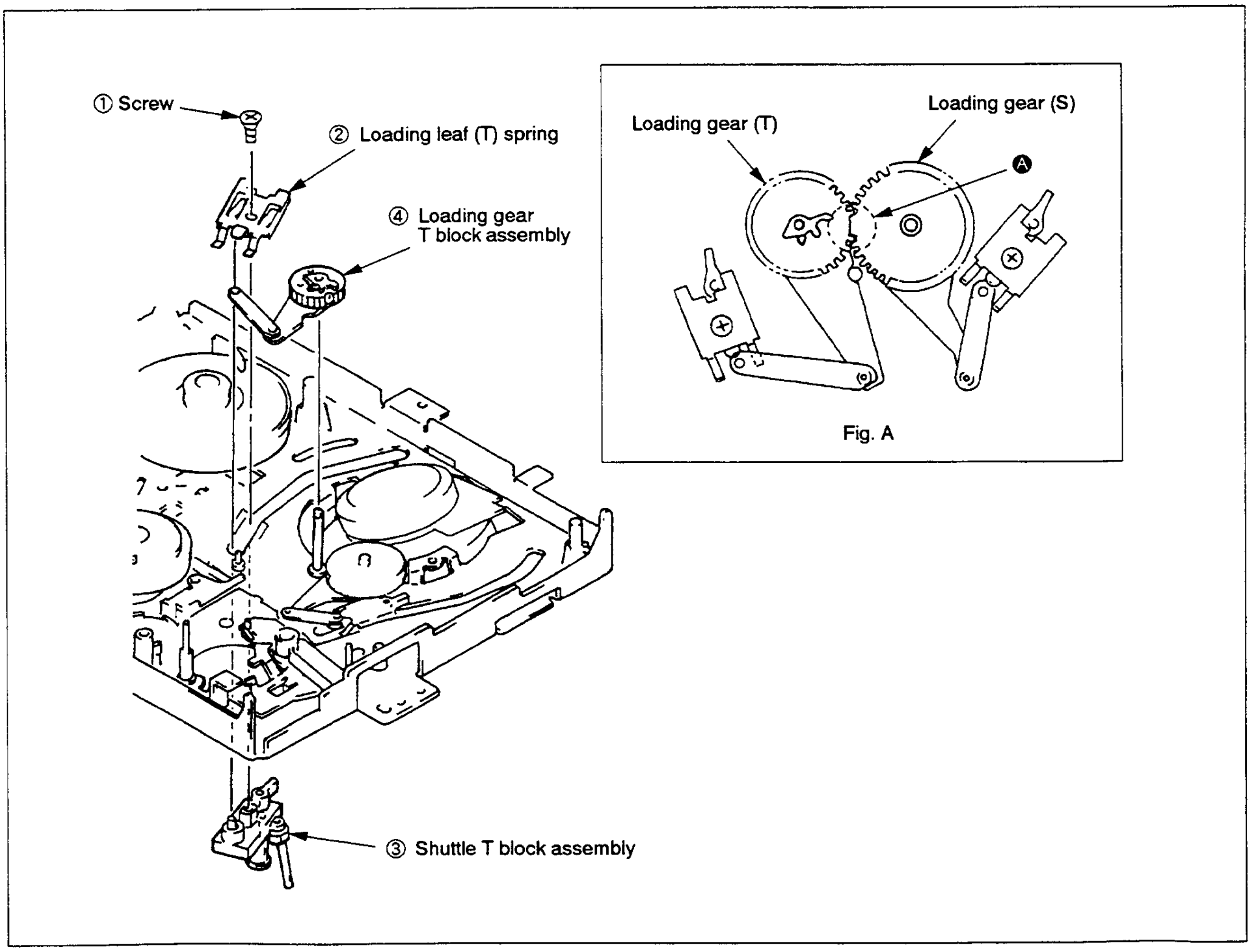

① Screw
② Loading leaf (T) spring
④ Loading gear T block assembly
③ Shuttle T block assembly
Loading gear (T)
Loading gear (S)
🅐
Fig. A

Fig. 3-21

3-20. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Fig. 3-22)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-15.)
5) Remove screw ① to remove loading leaf (S) spring ② and shuttle S block assembly ③.
6) Pull out loading gear S block assembly ④.

[Note on Mounting]

- Adjust the phase 🅐 between loading gear (S) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle S block assembly ③.

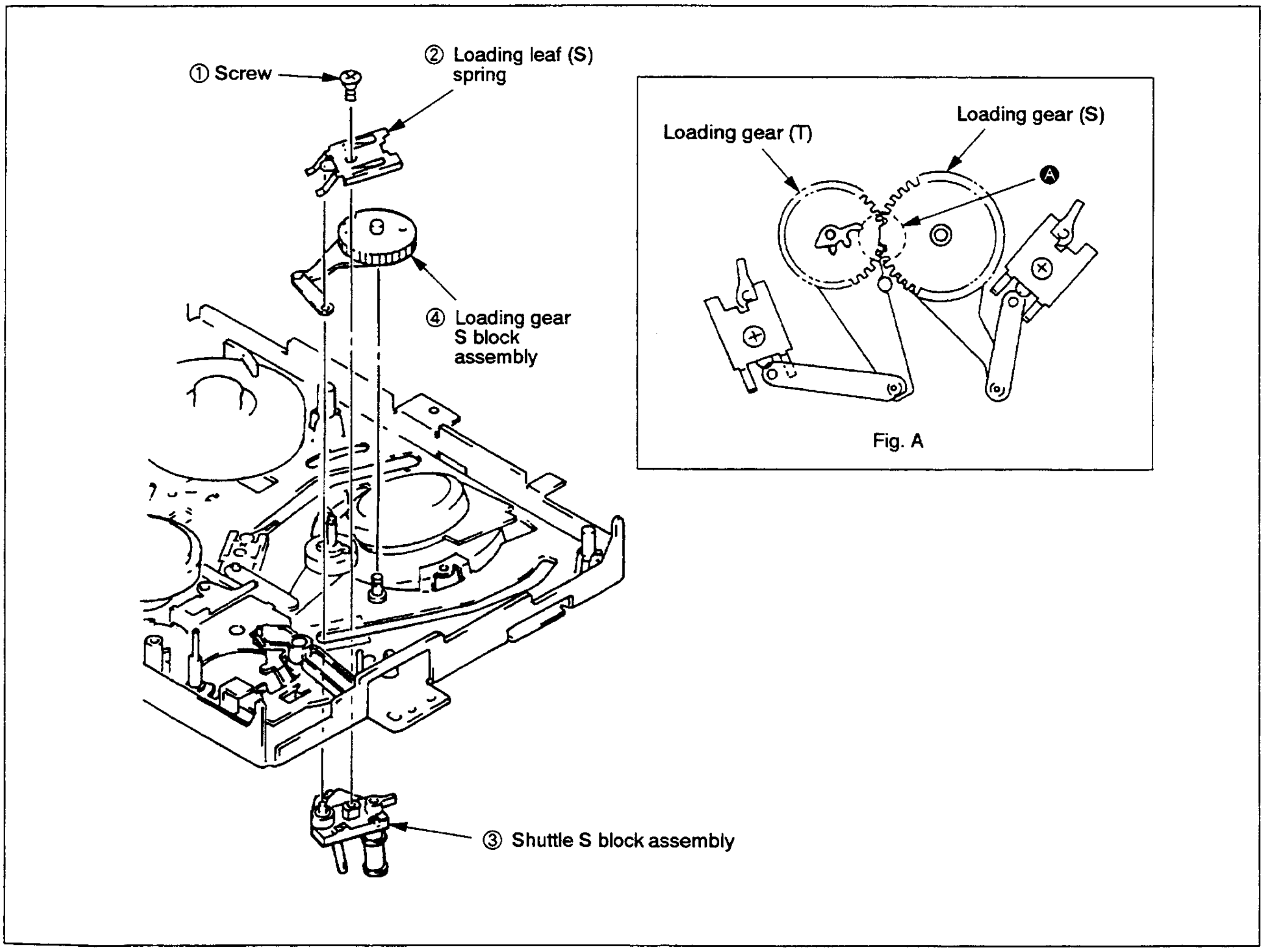

① Screw
② Loading leaf (S) spring
④ Loading gear S block assembly
③ Shuttle S block assembly
Loading gear (T)
Loading gear (S)
🅐
Fig. A

Fig. 3-22

3-21. REEL TABLE (S) ASSEMBLY (Fig. 3-23)

1) Remove tension spring ① from the chassis side.
2) Remove stopper washer (2) ② to pull out soft brake (S) ③.
3) Move TG1 band ④ over the reel table.
4) Remove stopper washer (2) ⑤.
5) While pressing main brake S assembly ⑥, pull out reel table (S) assembly ⑦.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (S) assembly ⑥. (Fig. A)
- Don't touch the hatched portion on reel table (S) assembly ⑥ with bare hand.

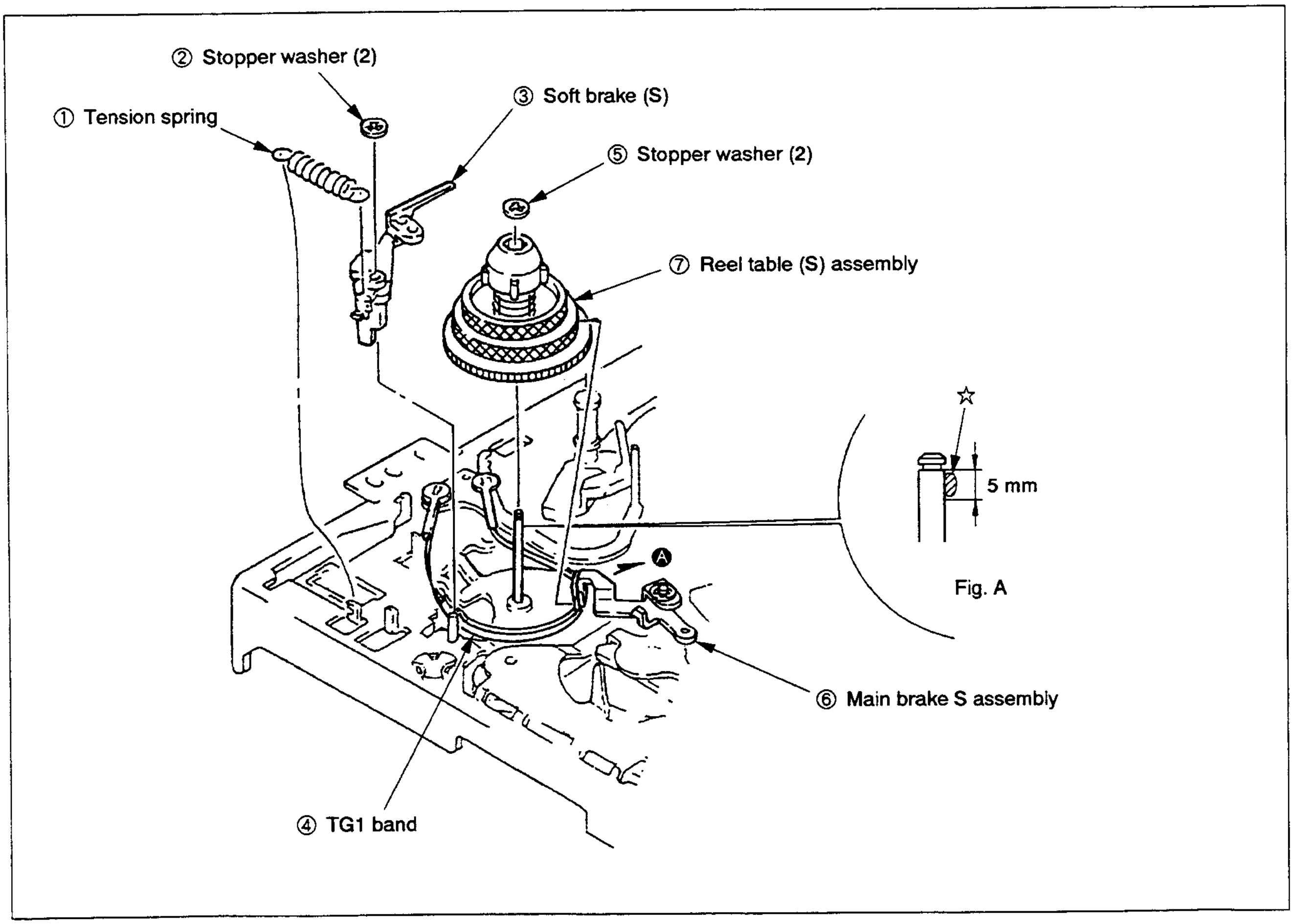

② Stopper washer (2)
① Tension spring
③ Soft brake (S)
⑤ Stopper washer (2)
⑦ Reel table (S) assembly
☆
5 mm
Fig. A
Ⓐ
⑥ Main brake S assembly
④ TG1 band

Fig. 3-23

3-22. TG1 ASSEMBLY (Fig. 3-24)

1) Set the mechanism to the loading-end condition referring to 1-1. (Cam gear indicates "LE". (Refer to Fig. A and B of Fig. 3-18.))
2) Remove tension spring ① in the order Ⓐ to Ⓑ.
3) Remove stopper washer (2) ② to pull out TG1 assembly ③.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion.
- Keep clean the felt side of TG1 assembly.

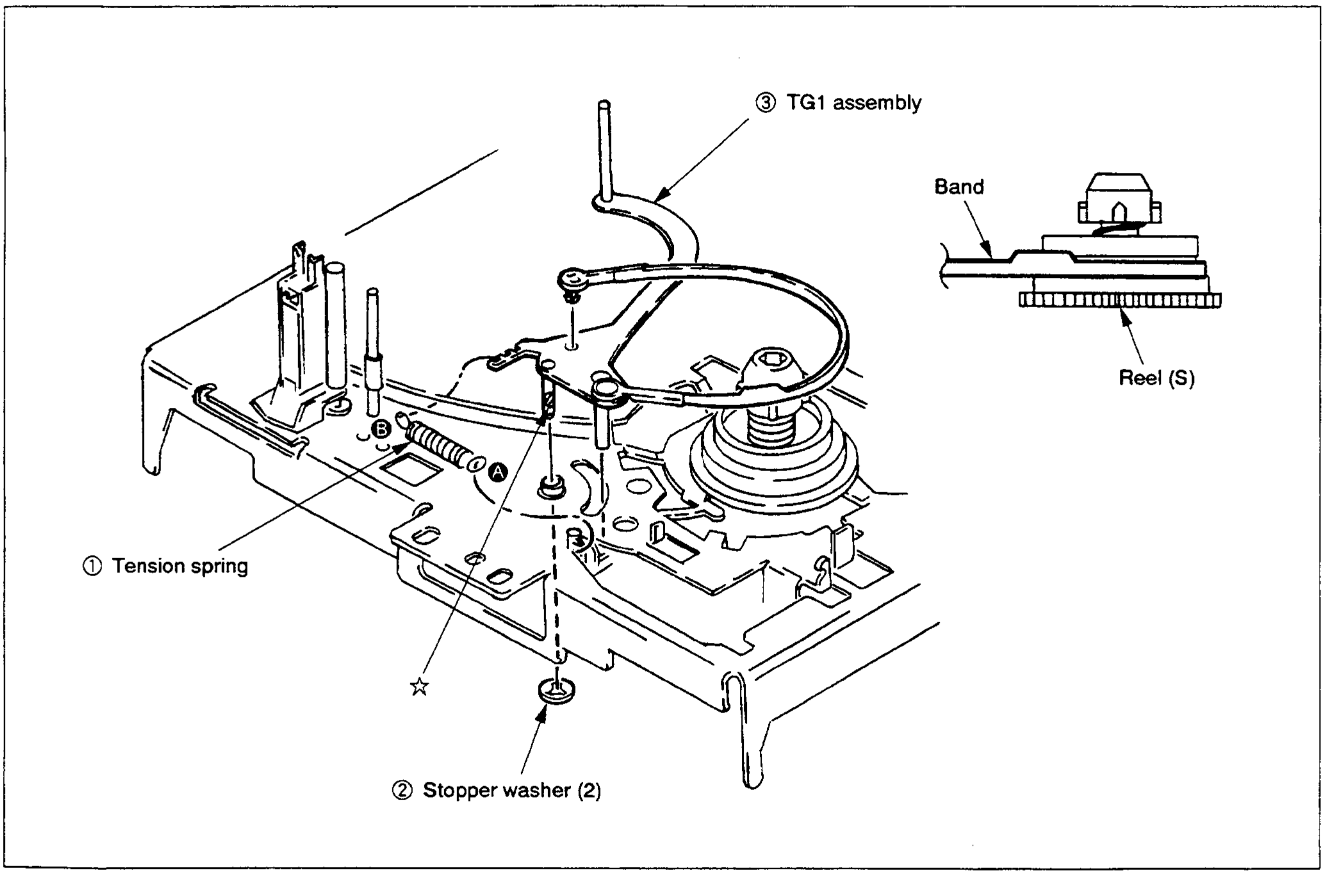

③ TG1 assembly
Band
Reel (S)
Ⓑ
Ⓐ
① Tension spring
☆
② Stopper washer (2)

Fig. 3-24

3-23. S WINDING BLOCK ASSEMBLY (Fig. 3-25)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove stopper washer (2) ① to pull out S winding block assembly ②.
6) Remove torsion spring ③.

[Note on Mounting]

- At the last, hang torsion spring ② to the position Ⓐ.
- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.

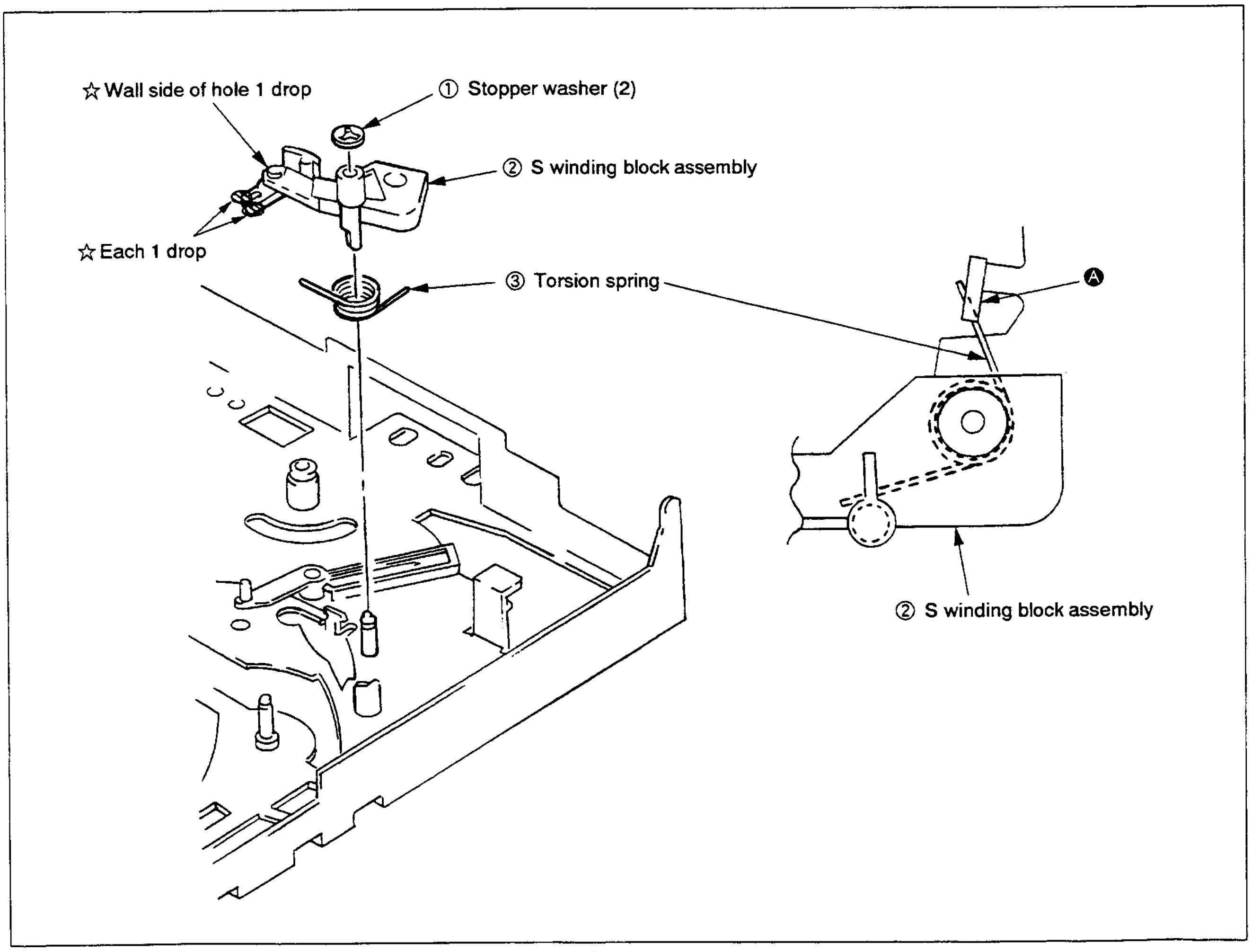

☆Wall side of hole 1 drop
① Stopper washer (2)
② S winding block assembly
☆Each 1 drop
③ Torsion spring
Ⓐ
② S winding block assembly

Fig. 3-25

3-24. TRIGGER LEVER AND RKB BLOCK ASSEMBLIES (Fig. 3-26)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove tension spring ① in the order 🅐 to 🅑 to remove trigger lever assembly ②.
6) Remove screws (3 × 8) ③ to remove RKB block assembly ④.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions on trigger lever assembly. (Fig. A)

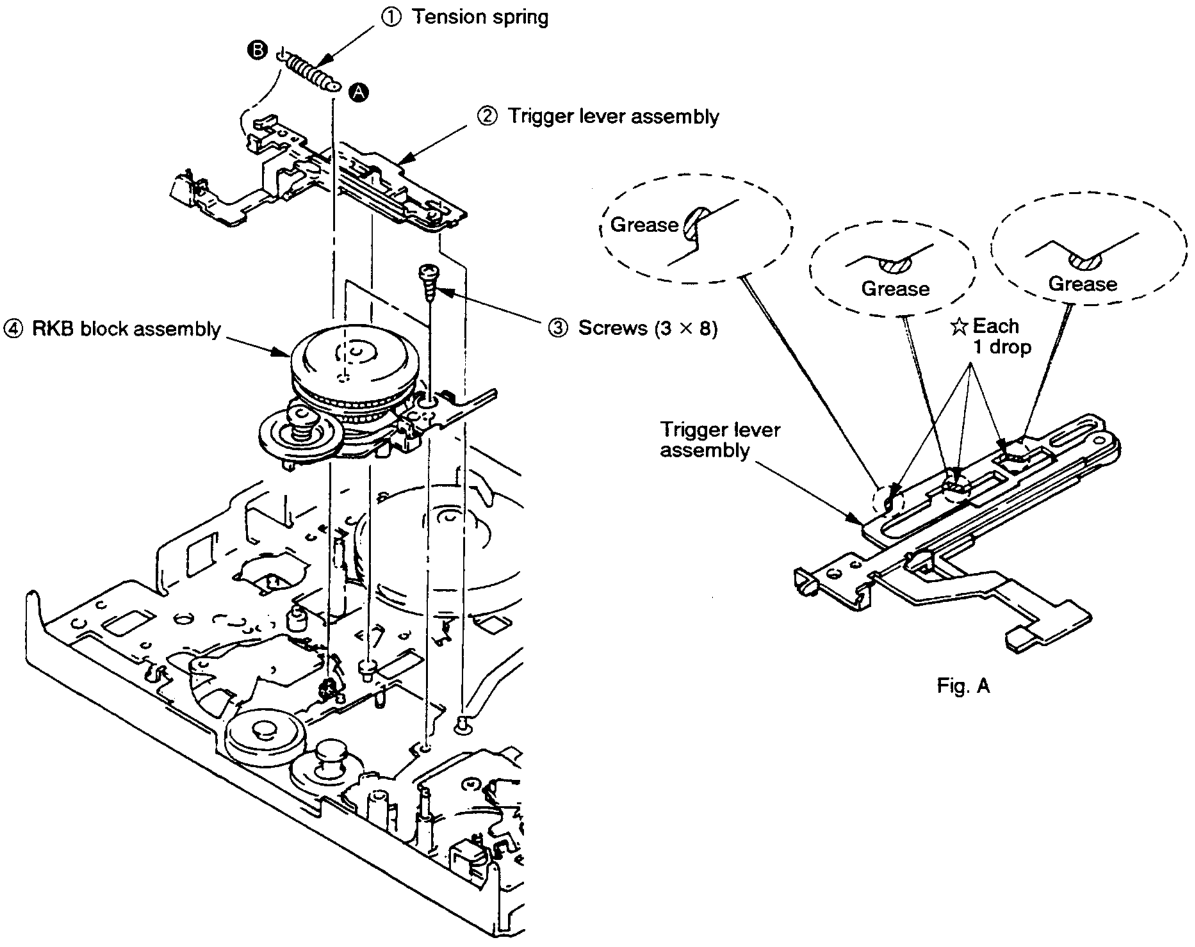

① Tension spring
🅑
🅐
② Trigger lever assembly
④ RKB block assembly
③ Screws (3 × 8)
Grease
Grease
Grease
☆Each 1 drop
Trigger lever assembly
Fig. A

Fig. 3-26

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.

Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory preadjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Treading is completed without a cassette loaded
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassete
Adjustment locations	Position for hooking the tension spring
Specified value	36 to 44 g•cm

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards: Move the spring toward direction Ⓐ.
When the reading is less than the standards: Move the spring toward direction Ⓑ.

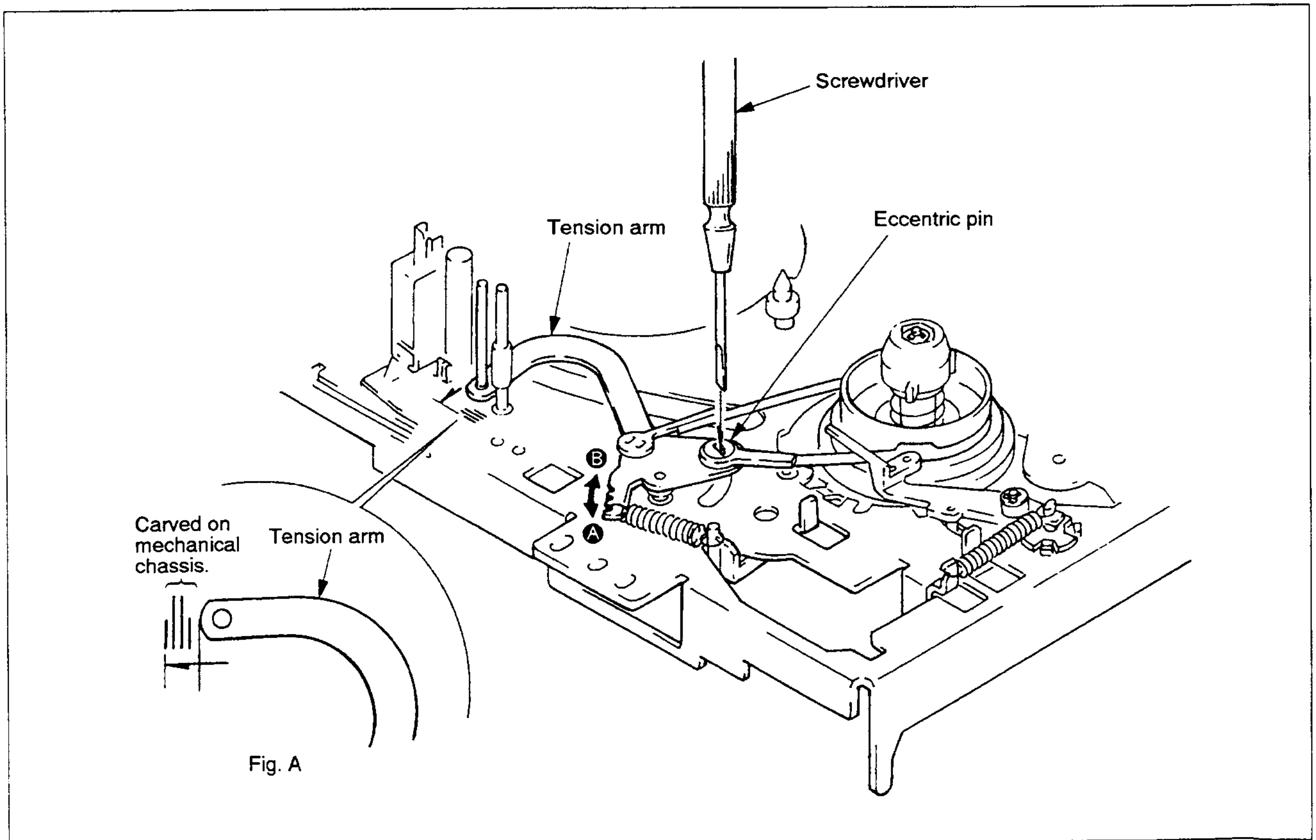


Fig. 4-1

4-1-2. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Fig. 4-2)

Mode	Playback
Jig	Blank tape
Adjustment locations	Guide roller height adjustment screw
Specified value	0 to 0.1 mm

Procedure:

1) Set the tape, during CUE playing back, check the height from lower flange of TG7 to the running tape. (Fig. A)
2) During REV playing back, check the height from lower flange of TG7 to the running tape. (Fig. B)
3) When the difference between items 1) and 2) doesn't go to specified value, adjust by turning TG8 guide roller height adjustment screw.
4) Check the tape is creased or not between the capstan and TG8, adjust with TG8 guide roller height adjustment screw so that the tape is not creased during normal playback, CUE and REV.

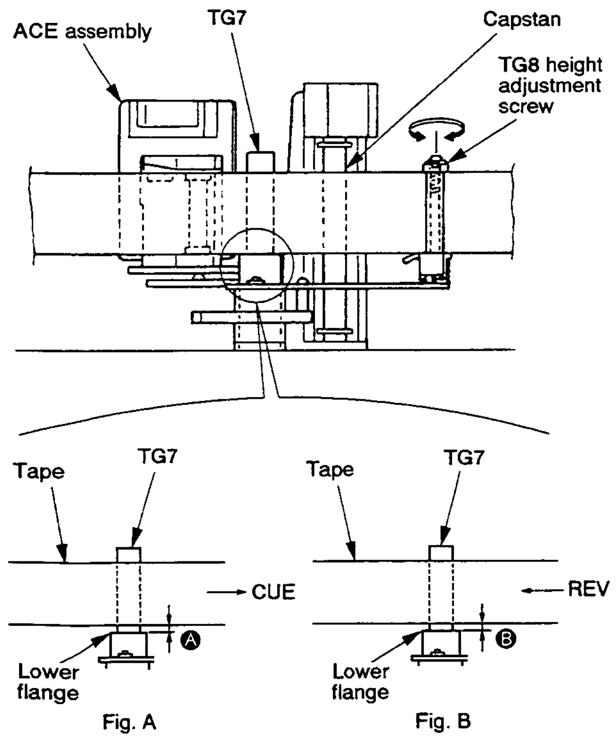

ACE assembly
TG7
Capstan
TG8 height adjustment screw
Tape
TG7
Tape
TG7
CUE
REV
Ⓐ
Ⓑ
Lower flange
Lower flange

Fig. A

Fig. B

Difference between Ⓐ and Ⓑ = 0 to 0.1 mm

Fig. 4-2

4-1-3. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6 (Fig. 4-3)

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller height adjuster screw

[Adjustment Method]

1) Tracking (playback): Turn off the auto tracking, then press the tracking buttons ▽ and △ simultaneously to set the tracking at the center position.
(If adjustment is made after the drum is replaced, the tracking must be set at the max. RF output position.)
2) Height adjuster screw: Even out the RF output waveforms.
3) Press the tracking buttons (playback), ▽ and △ alternately.
4) Check that RF output drops the same amount at the front and rear edges.

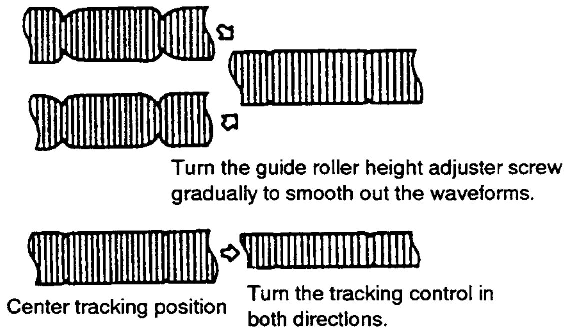

Turn the guide roller height adjuster screw gradually to smooth out the waveforms.
Center tracking position
Turn the tracking control in both directions.

Fig. 4-3

4-1-4. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 4-4 and 4-5)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Tool	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw, the azimuth adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

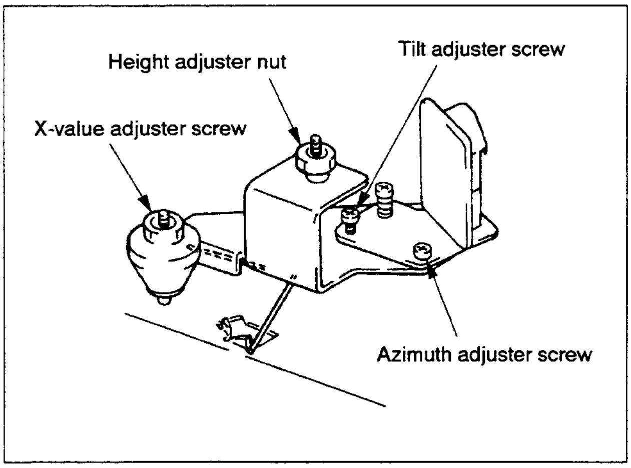

Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
Azimuth adjuster screw

Fig. 4-4

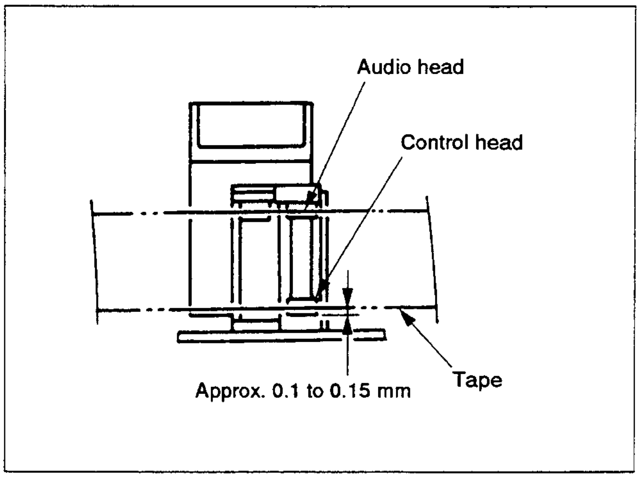

Audio head
Control head
Approx. 0.1 to 0.15 mm
Tape

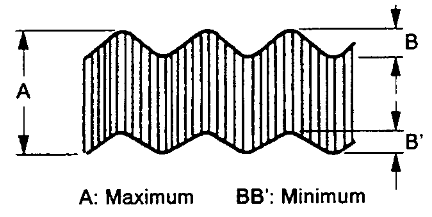
Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (1kHz track)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.



A
B
B'
A: Maximum
BB': Minimum

Fig. 4-6

4-1-6. X-VALUE ADJUSTMENT

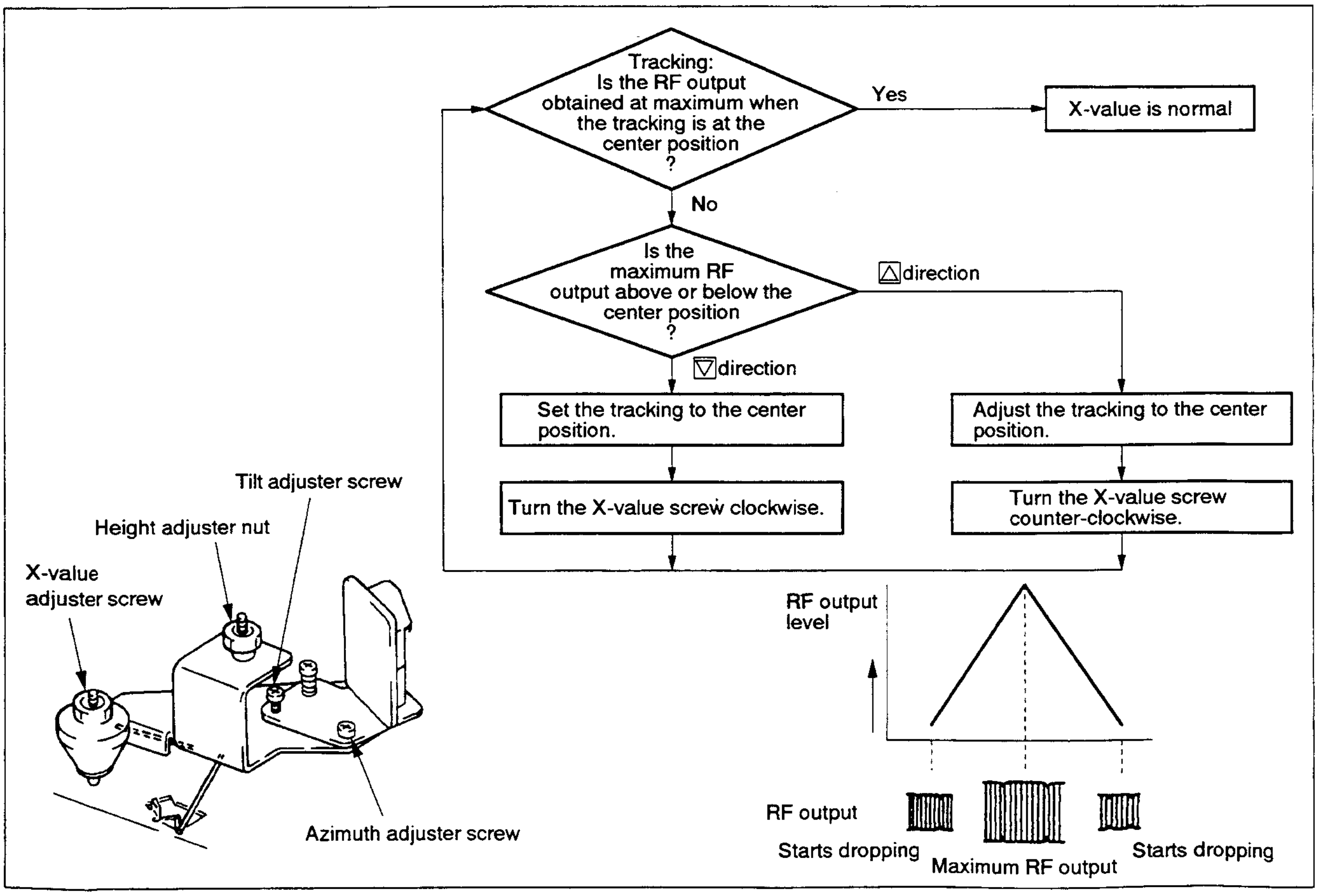
Purpose: To obtain compatibility with other VTR

Precaution: Be sure to perform the preset tracking adjustment before perform this adjustment. (Refer to the Service Guide.)
Turn off the auto tracking and set the VTR for manual tracking mode.

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	X-value adjuster screw

[Adjustment Method]

- **Adjustment by Hi-Fi alignment tape (NTSC only)**
  When the tracking is set at the center position (by pressing the ▽ and △ keys simultaneously), adjust the RF output to maximum.

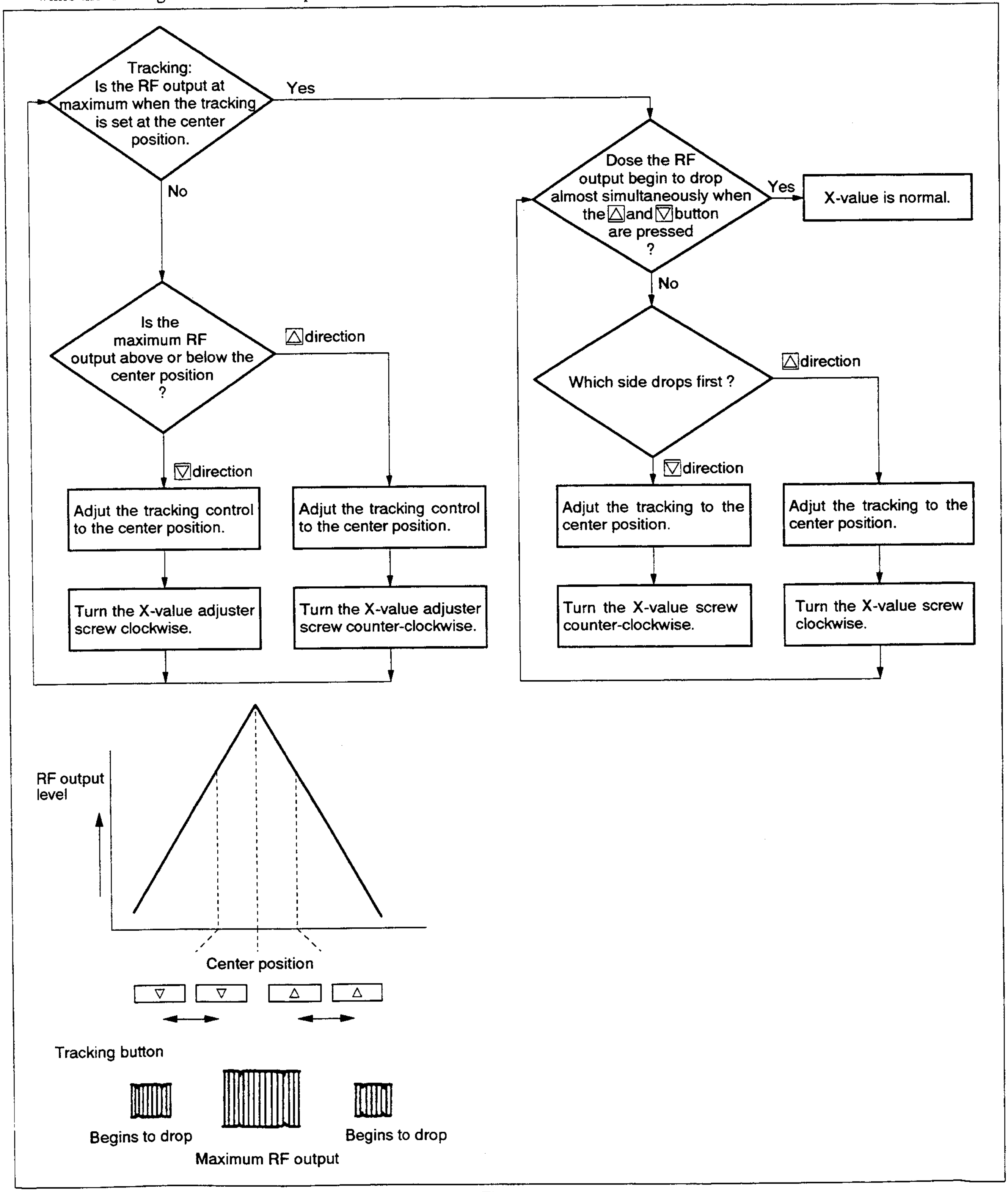


Tracking: Is the RF output obtained at maximum when the tracking is at the center position ?
Yes
X-value is normal
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Set the tracking to the center position.
Turn the X-value screw clockwise.
Adjust the tracking to the center position.
Turn the X-value screw counter-clockwise.
Tilt adjuster screw
Height adjuster nut
X-value adjuster screw
Azimuth adjuster screw
RF output level
RF output
Starts dropping
Maximum RF output
Starts dropping

Fig. 4-7

- **Adjustment by alignment tape**

  Adjust the X-value adjuster screw so that maximum RF output is obtained and also that the RF output drops to the same position on pressing the respective ▽ and △ buttons while the tracking is set at the center position.



Tracking:
Is the RF output at maximum when the tracking is set at the center position.
Yes
No
Dose the RF output begin to drop almost simultaneously when the △ and ▽ button are pressed ?
Yes
X-value is normal.
No
Is the maximum RF output above or below the center position ?
△ direction
▽ direction
Which side drops first ?
△ direction
▽ direction
Adjut the tracking control to the center position.
Adjut the tracking control to the center position.
Adjut the tracking to the center position.
Adjut the tracking to the center position.
Turn the X-value adjuster screw clockwise.
Turn the X-value adjuster screw counter-clockwise.
Turn the X-value screw counter-clockwise.
Turn the X-value screw clockwise.
RF output level
Center position
▽
▽
△
△
Tracking button
Begins to drop
Maximum RF output
Begins to drop

Fig. 4-8

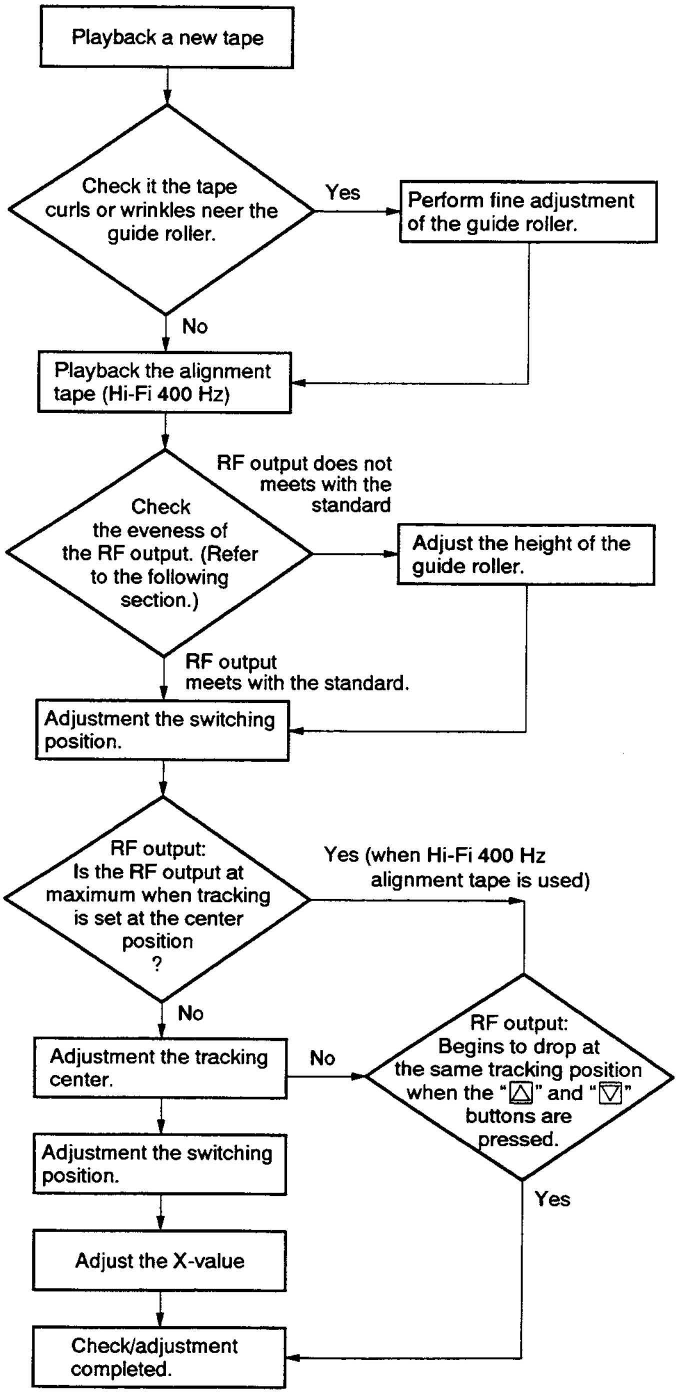
4-1-7. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Precaution: Turn off the auto tracking and set the manual tracking mode.

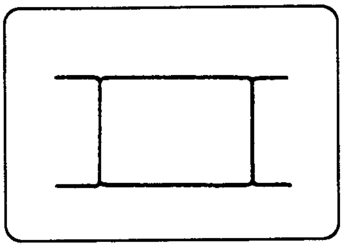
Mode	Playback
Signal	Alignment tape, blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller (refer to 4-1-2, 4-1-3.) Switching position, Tracking preset, SP delay mono-multi (Refer to the Service Manual), X-value. (refer to 4-1-6.)

[Adjustment Method]

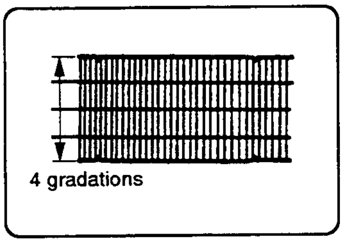

Playback a new tape
Check it the tape curls or wrinkles neer the guide roller.
Yes
Perform fine adjustment of the guide roller.
No
Playback the alignment tape (Hi-Fi 400 Hz)
Check the eveness of the RF output. (Refer to the following section.)
RF output does not meets with the standard
Adjust the height of the guide roller.
RF output meets with the standard.
Adjustment the switching position.
RF output: Is the RF output at maximum when tracking is set at the center position ?
Yes (when Hi-Fi 400 Hz alignment tape is used)
No
Adjustment the tracking center.
No
RF output: Begins to drop at the same tracking position when the "△" and "▽" buttons are pressed.
Yes
Adjustment the switching position.
Adjust the X-value
Check/adjustment completed.

[Checking the evenness and fluctuation of the RF output]

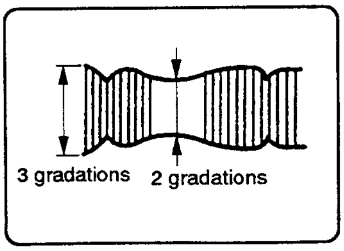
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

4-1-8. CHECKING THE TENSION AND TORQUE

Purpose: To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.

If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode without loading a cassette tape. (Refer to section 1-3.)
Measuring instrument	Torque gauge, Torque gauge adaptor

Item	VTR operation mode	Reel to be measured	Measurement value
Main brake torque	Stop	Supply and take-up reels	170 g•cm or more
Review torque	Review	Supply reel	180 ± 30 g•cm (using the torque cassette)
Take-up torque	Playback	Take-up reel	95 ± 25 g•cm (using the torque cassette)
Back tension torque	Playback	Take-up reel	33 to 44 g•cm (using the torque cassette)

[Check Method]

Measure the torque using the torque gauge and torque gauge adaptor with the torque gauge fixed.

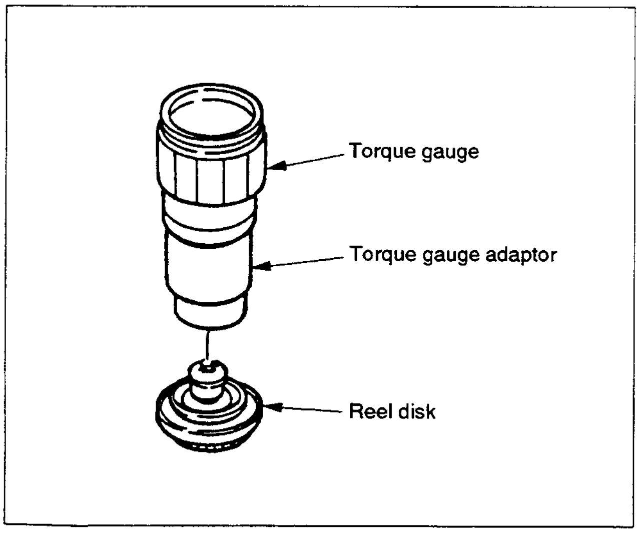


Fig. 4-9

V03056

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®

H MECHANISM

SERVICE MANUAL

SUPPLEMENT-1

1. **How to Use the Mode Selector Ⅱ for Adjusting H Type Mechanism Assembly.**
2. **Adjusting Mechanism Using New Alignment Tape (KRV-52NE For NTSC).**

File this supplement with the VHS mechanical adjustment Ⅳ.

TABLE OF CONTENTS

Section *Title* *Page*

1. HOW TO USE THE MODE SELECTOR Ⅱ FOR ADJUSTING H TYPE MECHANISM ASSEMBLY ······ 2

1-1. Outline ······ 2
1-2. Preparation ······ 2
1-3. Connection ······ 2
1-4. Operation ······ 2
1-5. Precautions ······ 2

2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52NE for NTSC) ······ 4

2-1. Adjustment Using Alignment Tape (KRV-52NE for NTSC having no version No.) ······ 4
  2-1-1. X-Value Adjustment (Using the tape having no version No.) ······ 4
2-2. Adjustment Using Alignment Tape (KRV-52NE for NTSC having the version No.) ······ 6
  2-2-1. X-Value Adjustment (Using the tape having the version No.) ······ 6
2-3. Adjusting the Mechanism Using Alignment Tape (KRV-52NE for NTSC) ······ 10
  2-3-1. Height Adjustment of Guide Rollers No. 3 and No. 6 ······ 10
  2-3-2. ACE Head Assembly Adjustment (Rough Adjustment) ······ 11
  2-3-3. ACE Head Assembly Adjustment (Precision Adjustment) ······ 11
  2-3-4. Adjustments After Replacing the Drum (Video Head) ······ 12

MICROFILM

1. HOW TO USE THE MODE SELECTOR Ⅱ FOR ADJUSTING H TYPE MECHANISM ASSEMBLY

1-1. OUTLINE

To activate the VHS system H type mechanism assembly using mode selector Ⅱ (J-6082-282-A), use connector conversion jig (J-6090-052-A). By using the connector conversion jig, the following operations are possible.

- Loading and unloading action by the loading motor
- Reading of the current setting of the mode switch
- Normal and reverse rotation of the capstan motor

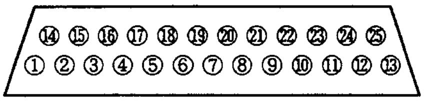
1-2. PREPARATION

1-2-1. ADDITION OF POWER SUPPLY CABLE (Already added Mode Selector Ⅱ also available)

In order to drive the capstan motor, the power +5 V and +12 V are supplied from the Mode Selector Ⅱ. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	DSUB connector of the mode selector Ⅱ	Voltage
Pin 1 (Red index)	Pin 20	+12 V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5 V

- Connector pin number assignment of the DSUB connector (From the soldering side)



- When connections are made, check that +5 V and +12 V are available at the 3-pin cable connector.

1-2-2. CHECKING THE SOFTWARE VERSION

Turn on the power of the mode selector II.

If the reading for the software version on the mode selector II is not 1.10 or higher, replace the New ROM (J-6082-314-A).

1-3. CONNECTION

1-3-1. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR Ⅱ (See Fig. 1-1)

Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the mode selector Ⅱ to the corresponding connectors on the connector conversion jig (J-6090-052-A).

1-3-2. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE H TYPE MECHANISM ASSEMBLY

With the power of the mode selector Ⅱ turned off, insert the following three connectors to the corresponding connectors on the H type mechanism assembly.

- 3-pin connector for the loading motor
- 5-pin connector for the mode switch
- 8-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counter-clockwise).

1-4. OPERATION

1-4-1. OPERATION OF THE LOADING MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) Select the H type mechanism assembly setting on the mode selector Ⅱ .

(2) After this, procedures are the same as those for the previous model types.
For the operating method, see pages 3 to 5 of "8 mm Video Mechanism Manual Ⅵ (TK Mechanism) Supplement-1".
For the loading method, see page 3 of "VHS Mechanical Adjustment Manual Ⅳ (H Mechanism)".

1-4-2. OPERATION OF THE CAPSTAN MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) For the loading motor operation under Section 1-4-1, change the mode setting to the FF/REW mode with the mode switch.

(2) Turn the speed control gradually in clockwise direction, and the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FWD/RVS setting of the rotating direction switch.

1-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the mode selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the mode selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via foreign conductive materials.

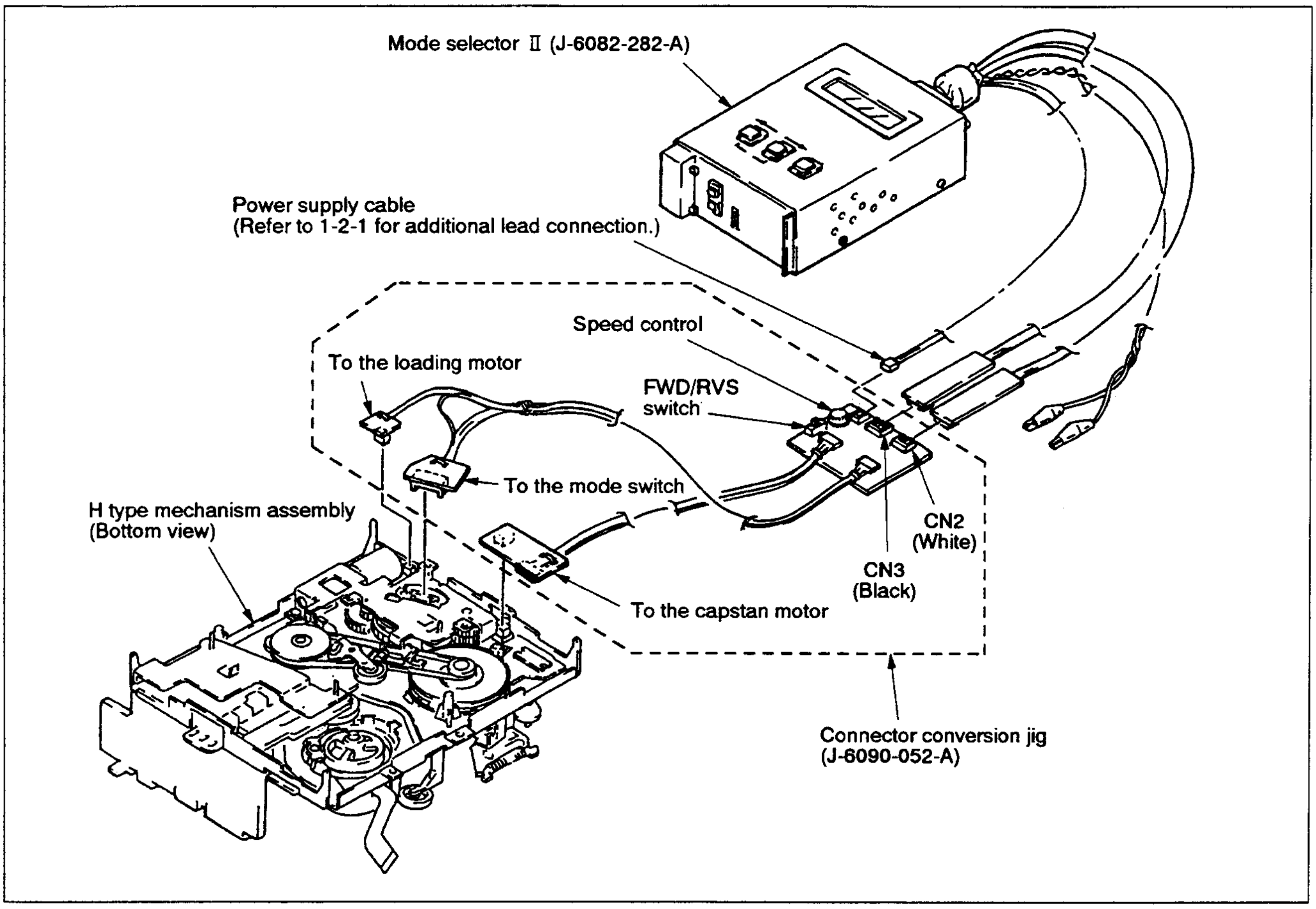

Mode selector Ⅱ (J-6082-282-A)
Power supply cable
(Refer to 1-2-1 for additional lead connection.)
Speed control
To the loading motor
FWD/RVS switch
To the mode switch
H type mechanism assembly
(Bottom view)
CN2
(White)
CN3
(Black)
To the capstan motor
Connector conversion jig
(J-6090-052-A)

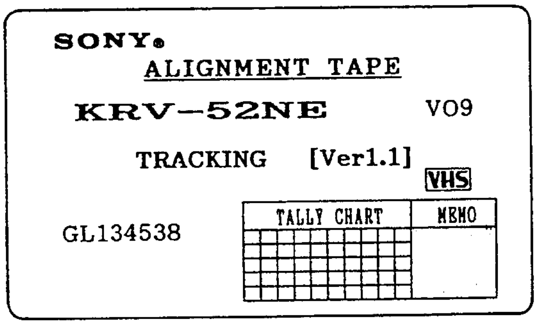
Fig. 1-1

2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52NE for NTSC)

The conventional alignment tape (For NTSC) is now replaced with alignment tape KRV-52NE, and the following describes how to align the mechanism using the KRV-52NE. For details on the use of KRV-51N2 for each model, refer to the service manuals which will be issued in the future.

Name	Parts No.	Remarks
Alignment tape KRV-52NE for NTSC	8-192-605-41	For tape path, audio azimuth, and X-value adjustments
Alignment tape KRV-51N2 for NTSC	8-192-605-32	For electrical adjustments (RF, AF, and switching position) and operation check

Note: The KRV-52NE has or does not have Ver No. depending on new or old type as shown below. (New one has Ver No.)
Note that an adjusting method of X-value is different.



SONY®
ALIGNMENT TAPE
KRV—52NE V09
TRACKING [Ver1.1]
VHS
GL134538

TALLY CHART	MEMO

Contents:
KRV-52NE (NTSC)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz full tracks

KRV-51N2 (NTSC)

Class	Mode	Time	Video	Audio (HiFi/Normal)
1	SP	7 min.	Color bar	400 Hz
2	SP	3 min.	Mono. scope	400 Hz
3	EP	7 min.	Color bar	400 Hz
4	EP	3 min.	Mono. scope	400 Hz

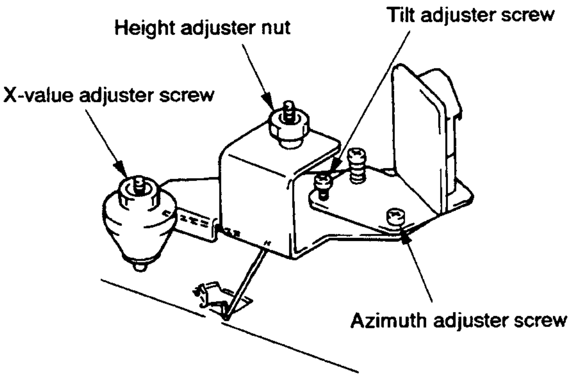
2-1. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having no version No.)

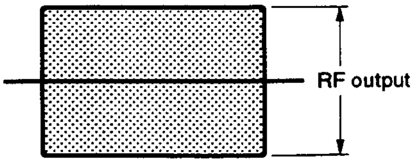
2-1-1. X-VALUE ADJUSTMENT (Using the tape having no version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw

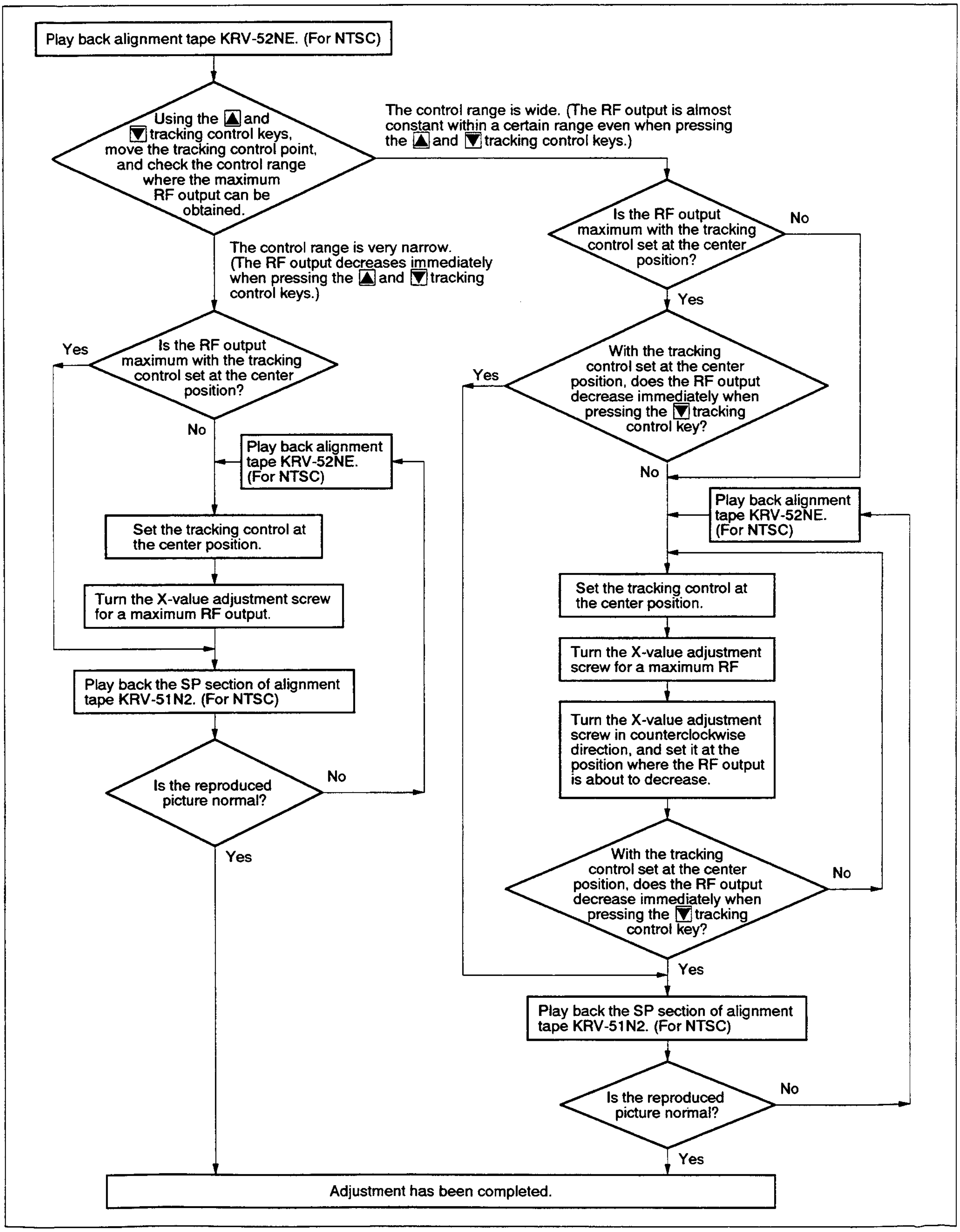




RF output shall be maximum at the center position of the tracking control.

[Adjustment Method]
Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

X-VALUE ADJUSTMENT (Using the tape having no version No.)


Play back alignment tape KRV-52NE. (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF output.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Adjustment has been completed.

When adjustment is complete, adjust the height of No. 3 and No. 6 guide rollers on page 10.

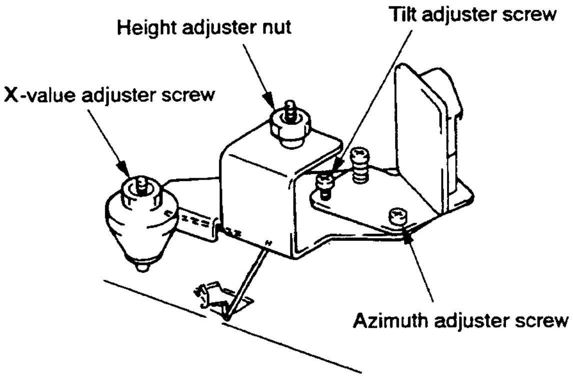
2-2. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having the version No.)

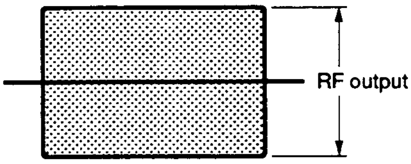
2-2-1. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having the version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw



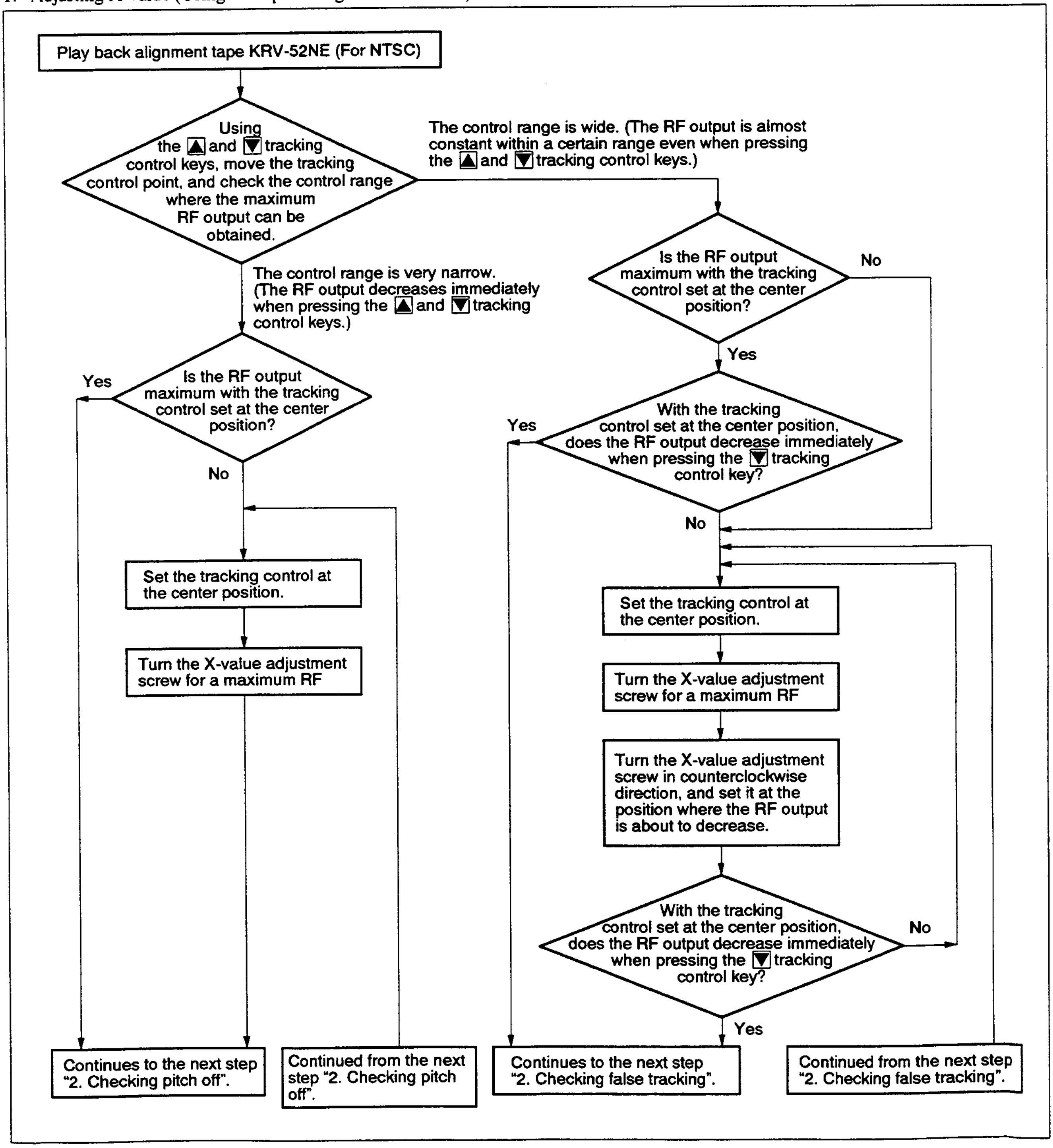


RF output shall be maximum at the center position of the tracking control.

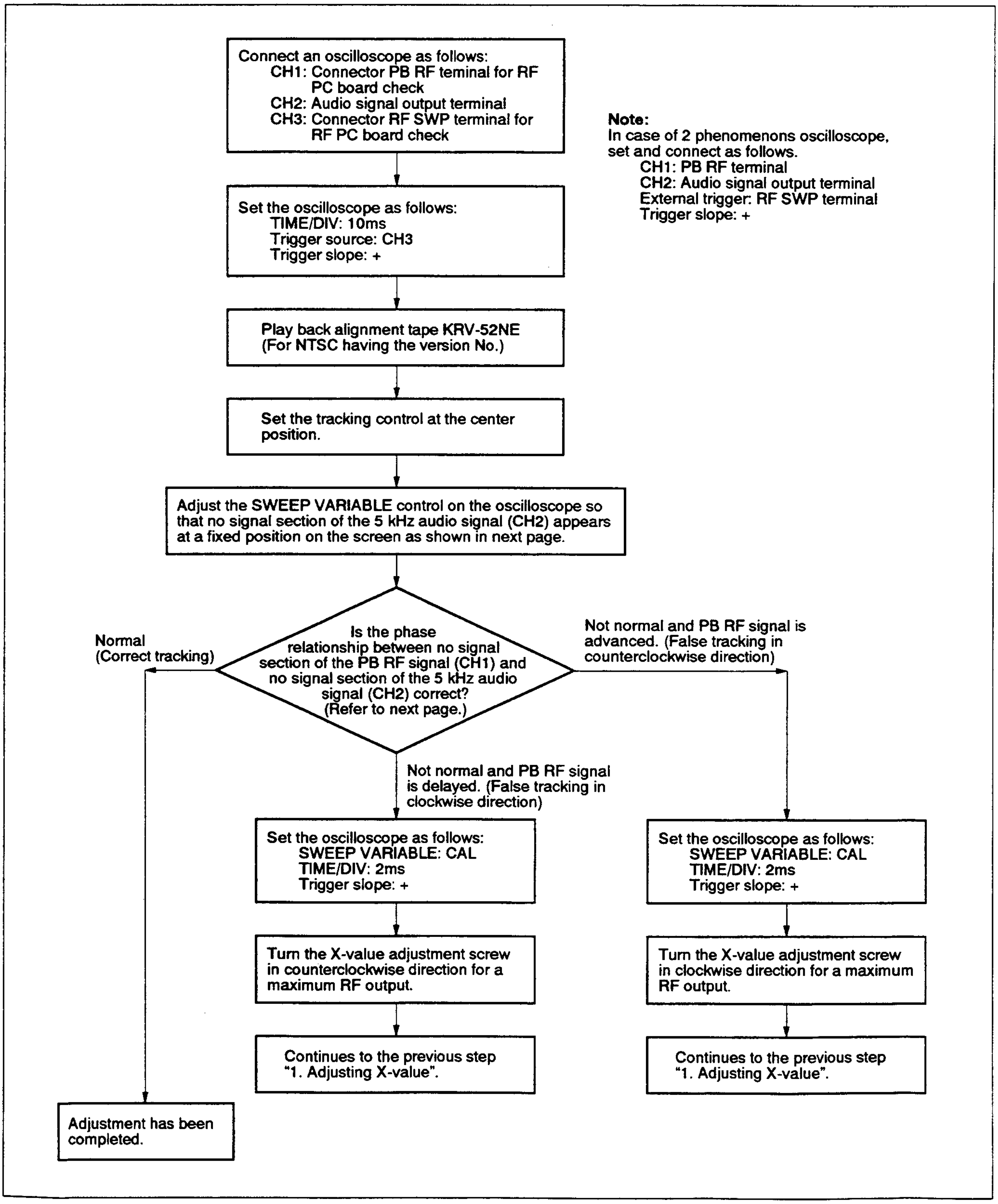
[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

1. Adjusting X-value (Using the tape having the version No.)


Play back alignment tape KRV-52NE (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
No
Yes
Yes
Is the RF output maximum with the tracking control set at the center position?
No
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking pitch off".
Continued from the next step "2. Checking pitch off".
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

2. Checking false tracking (Using the tape having the version No.)



Connect an oscilloscope as follows:
CH1: Connector PB RF terminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check

Note:
In case of 2 phenomenons oscilloscope, set and connect as follows.
CH1: PB RF terminal
CH2: Audio signal output terminal
External trigger: RF SWP terminal
Trigger slope: +

Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source: CH3
Trigger slope: +

Play back alignment tape KRV-52NE (For NTSC having the version No.)

Set the tracking control at the center position.

Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.

Is the phase relationship between no signal section of the PB RF signal (CH1) and no signal section of the 5 kHz audio signal (CH2) correct? (Refer to next page.)

Normal (Correct tracking)

Adjustment has been completed.

Not normal and PB RF signal is delayed. (False tracking in clockwise direction)

Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +

Turn the X-value adjustment screw in counterclockwise direction for a maximum RF output.

Continues to the previous step "1. Adjusting X-value".

Not normal and PB RF signal is advanced. (False tracking in counterclockwise direction)

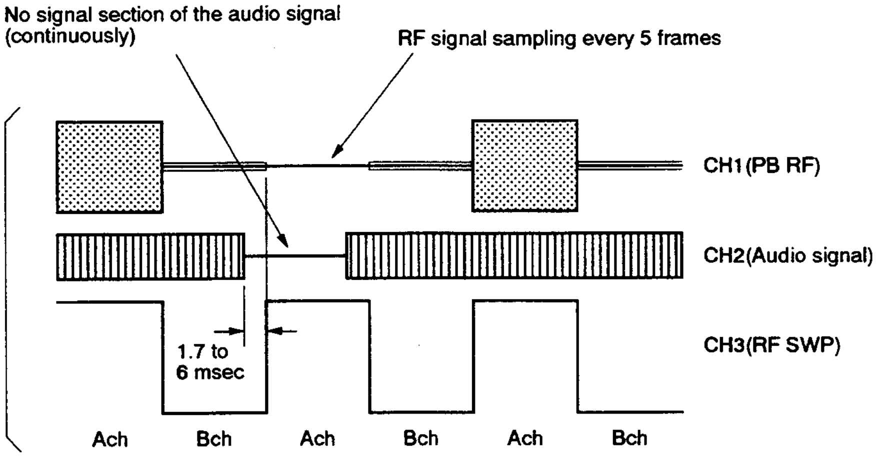
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +

Turn the X-value adjustment screw in clockwise direction for a maximum RF output.

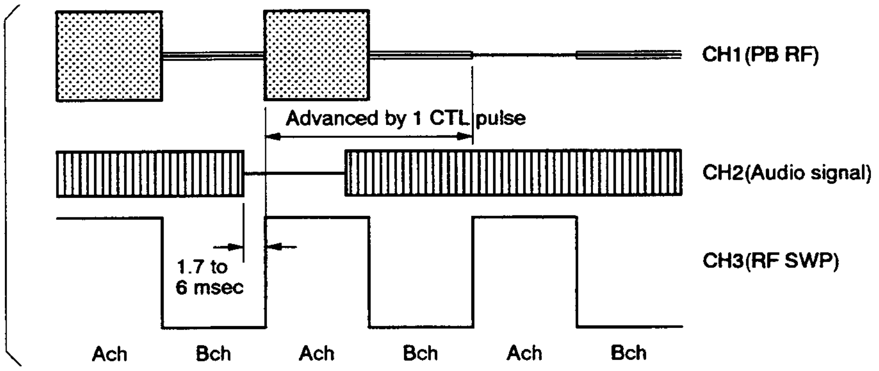
Continues to the previous step "1. Adjusting X-value".

Using the tape having the version No.

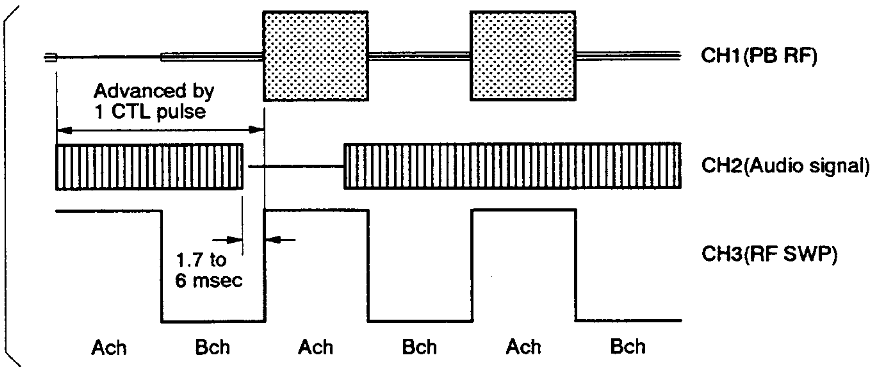
Normal tracking


No signal section of the audio signal (continuously)
RF signal sampling every 5 frames
CH1 (PB RF)
CH2(Audio signal)
CH3(RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

False tracking delayed by 1 CTL pulse (in clockwise direction)


CH1 (PB RF)
Advanced by 1 CTL pulse
CH2(Audio signal)
CH3(RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

False tracking advanced by 1 CTL pulse (in counterclockwise direction)


CH1 (PB RF)
Advanced by 1 CTL pulse
CH2(Audio signal)
CH3(RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

2-3. ADJUSTING THE MECHANISM USING ALIGNMENT TAPE (KRV-52NE for NTSC)

2-3-1. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

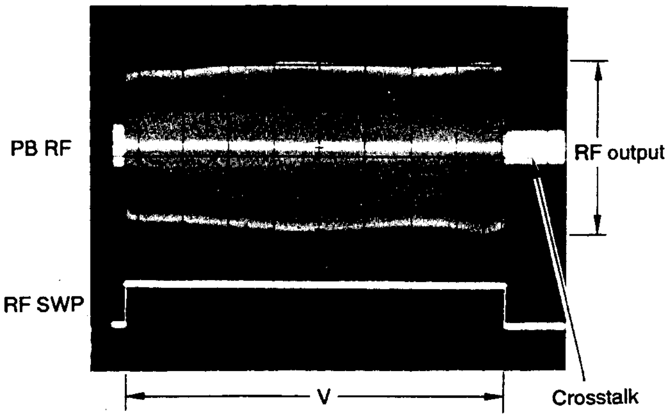
Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No.3 tape guide roller Height adjustment screw for No.6 tape guide roller

[Adjustment Method]

The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check".

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

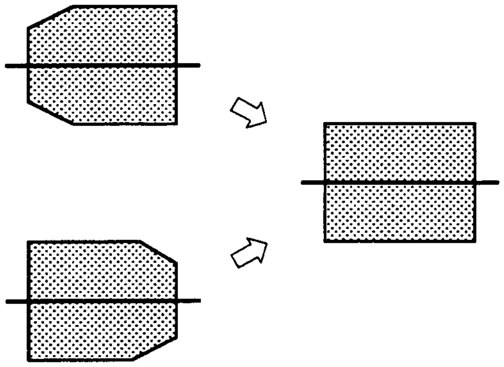


3) Turn the height adjustment screws of tape guide rollers No.3 and No.6 so that the RF output envelope becomes as flat as possible.

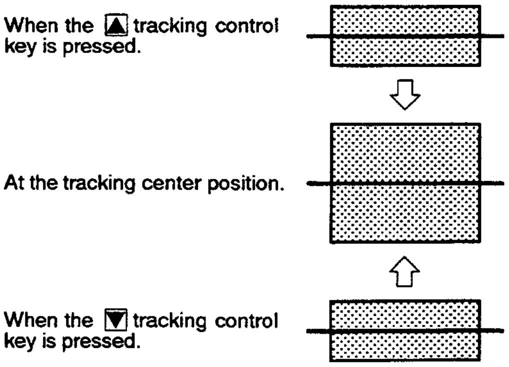
4) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

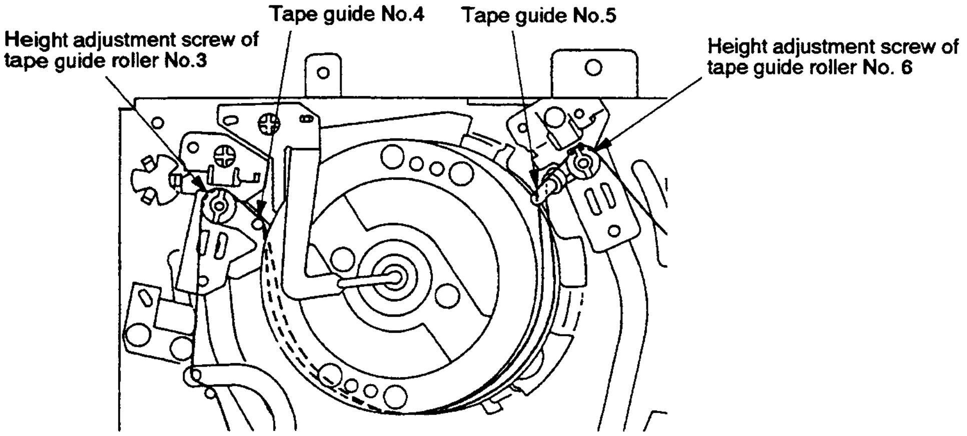
5) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

Turn the height adjustment screws of tape guide rollers No.3 and No.6 little by little so that the RF output envelope becomes as flat as possible.



Press the ▼ tracking control key, then the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.


When the ▲ tracking control key is pressed.
At the tracking center position.
When the ▼ tracking control key is pressed.


Tape guide No.4
Tape guide No.5
Height adjustment screw of tape guide roller No.3
Height adjustment screw of tape guide roller No. 6

2-3-2. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 2-1 and 2-2)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Jig	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw and the height adjuster nut.
(The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

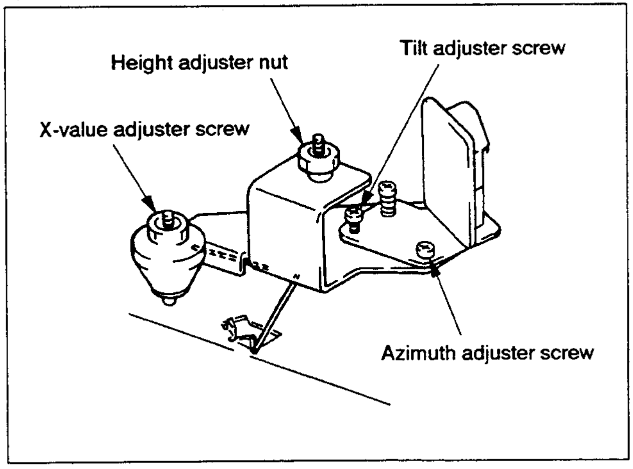


Fig. 2-1

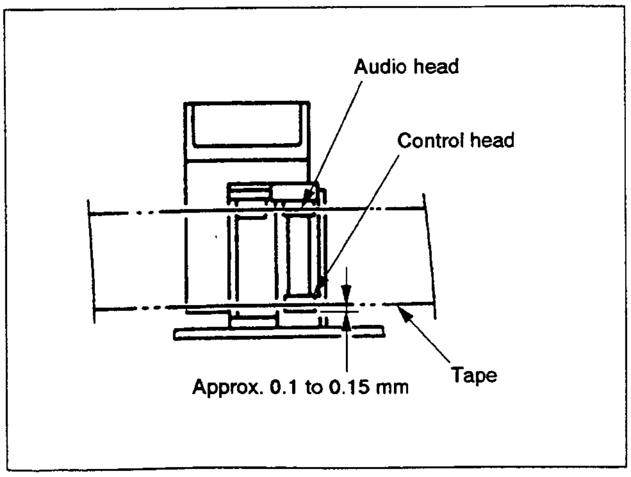


Fig. 2-2

2-3-3. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (KRV-52NE 5 kHz) (For NTSC)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

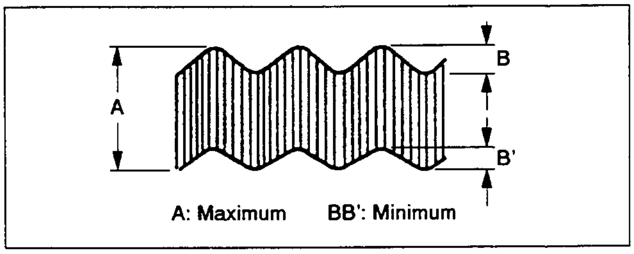


Fig. 2-3

2-3-4. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

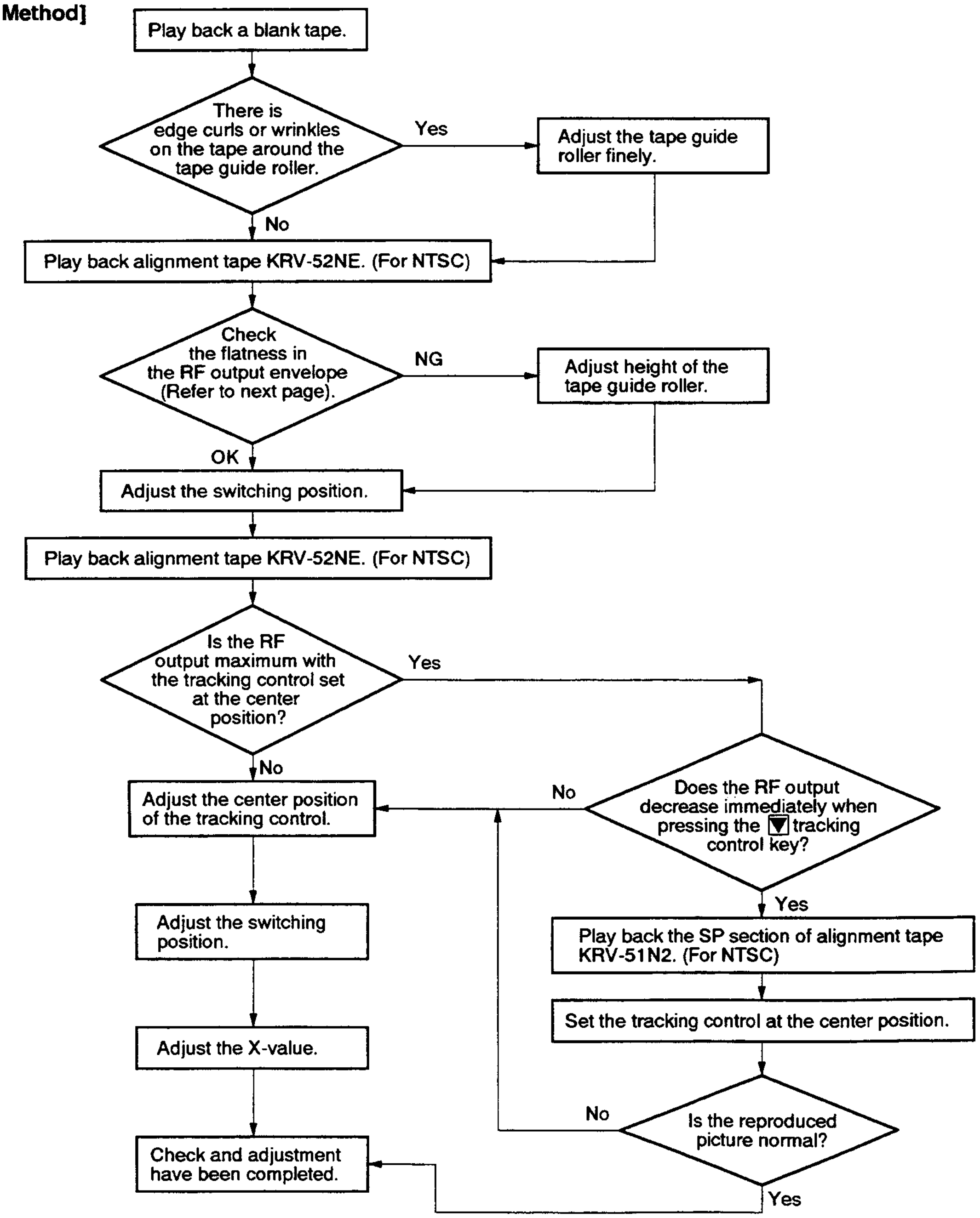
Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Note 1: Deactivate the automatic tracking control for setting the mechanism in manual tracking control mode.

Note 2: To set the tracking control at the center position, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

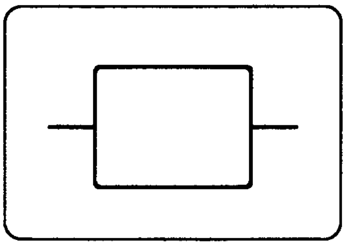
Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC), blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SWP pin for RF PC board check.
Adjustment locations	Guide roller (Refer to 2-3-1.) Switching position (Refer to the Service Manual) X-value (Refer to 2-1-1, 2-1-2.)

[Adjustment Method]

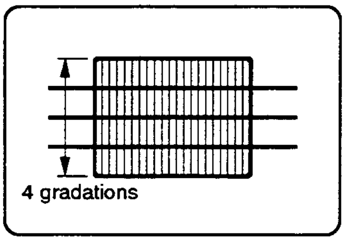

Play back a blank tape.
There is edge curls or wrinkles on the tape around the tape guide roller.
Yes
Adjust the tape guide roller finely.
No
Play back alignment tape KRV-52NE. (For NTSC)
Check the flatness in the RF output envelope (Refer to next page).
NG
Adjust height of the tape guide roller.
OK
Adjust the switching position.
Play back alignment tape KRV-52NE. (For NTSC)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Adjust the center position of the tracking control.
No
Does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
Adjust the switching position.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Set the tracking control at the center position.
Adjust the X-value.
No
Is the reproduced picture normal?
Check and adjustment have been completed.
Yes

[Checking the evenness and fluctuation of the RF output]

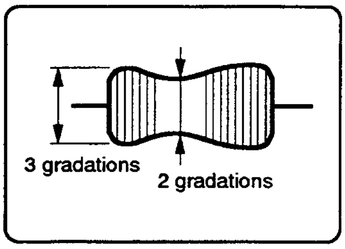
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

VHS MECHANICAL ADJUSTMENT MANUAL IV

English
95D05112-1
Printed in Japan

© 1995. 4

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

Published by Personal A&V Products Div.
Quality Engineering Dept.

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-2

File this supplement with the VHS mechanical adjustment IV and supplement-1.

TABLE OF CONTENTS

Section *Title* *Page*

1. CORRECTION ···································· 1
1-1. Adjustment Sequence ································ 1

2. MODIFICATION ·································· 2
2-1. Changing the Recorded Contents of Alignment Tape ··· 2
2-2. TG2 Roller, FE Head Assembly ······················ 2
2-3. TG3, TG6 Guide Roller Assembly ···················· 3
2-4. TG8 Assembly ······································ 4
2-5. Tension Regulator (TG1) Position
Tension Adjustment ································· 5
2-6. TG8 Guide Roller Height Adjustment ················· 6

1. CORRECTION

In the VHS Mechanism Adjustment Manual IV (Supplement-1), an adjustment sequence was wrong, and it is corrected as follow;

1-1. Adjustment Sequence (VHS Mechanism Adjustment Manual IV (Supplement-1) Page 6 to 11)

(1) Adjustment of No. 3 and No. 6 guide roller height
Delete the "The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check" under "Adjustment Method" on page 10.

(2) Adjustment of ACE head assembly

Note: In the adjustment of ACE head assembly (coarse adjustment and fine adjustment), if a azimuth, height and tilt were adjusted, again adjust the height of No. 3 and No. 6 guide rollers.

(3) Adjustment of X value

MICROFILM

2. MODIFICATION

2-1. CHANGING THE RECORDED CONTENTS OF ALIGNMENT TAPE

KRV-52NE (NTSC) (Ver. 1.2)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz → 4 kHz full tracks

2-2. TG2 ROLLER, FE HEAD ASSEMBLY (Refer to VHS Mechanical Adjustment Manual IV page14)

- The TG2 roller is provided with either of two types, fixed or straight. For the fixed type, section 3-5 is added.

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove screw ① to pull out FE head assembly ②.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller.

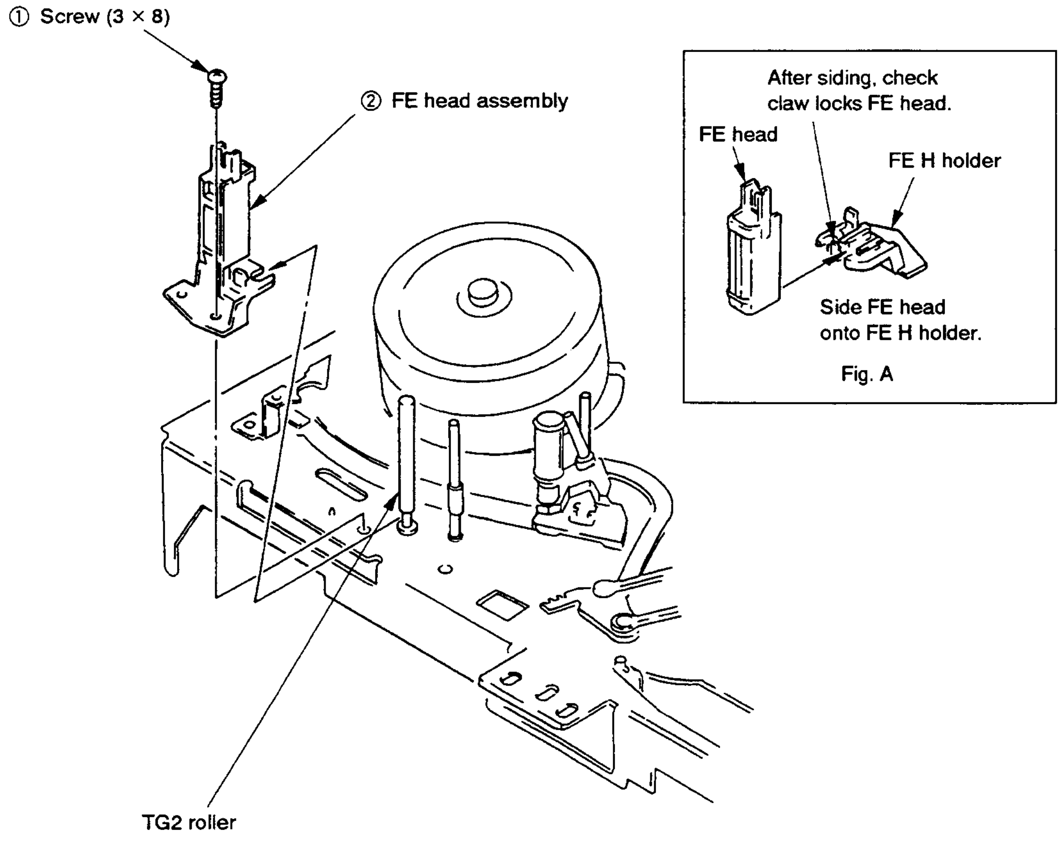

① Screw (3 × 8)
② FE head assembly
TG2 roller
After siding, check claw locks FE head.
FE head
FE H holder
Side FE head onto FE H holder.
Fig. A

Fig. 3-5

2-3. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual IV page 17)

- There is another type in TG3 and TG6 guide roller assemblies, which is not attached with a screw (B2X3). For the screwless type, section 3-8 is added.

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) TG3 guide roller assembly ① by turning it in arrow Ⓐ direction.
2) Removal the spring ②.
3) TG6 guide roller assembly ③ by turning it in arrow Ⓑ direction.
4) Removal the spring ④.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ①, ③.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

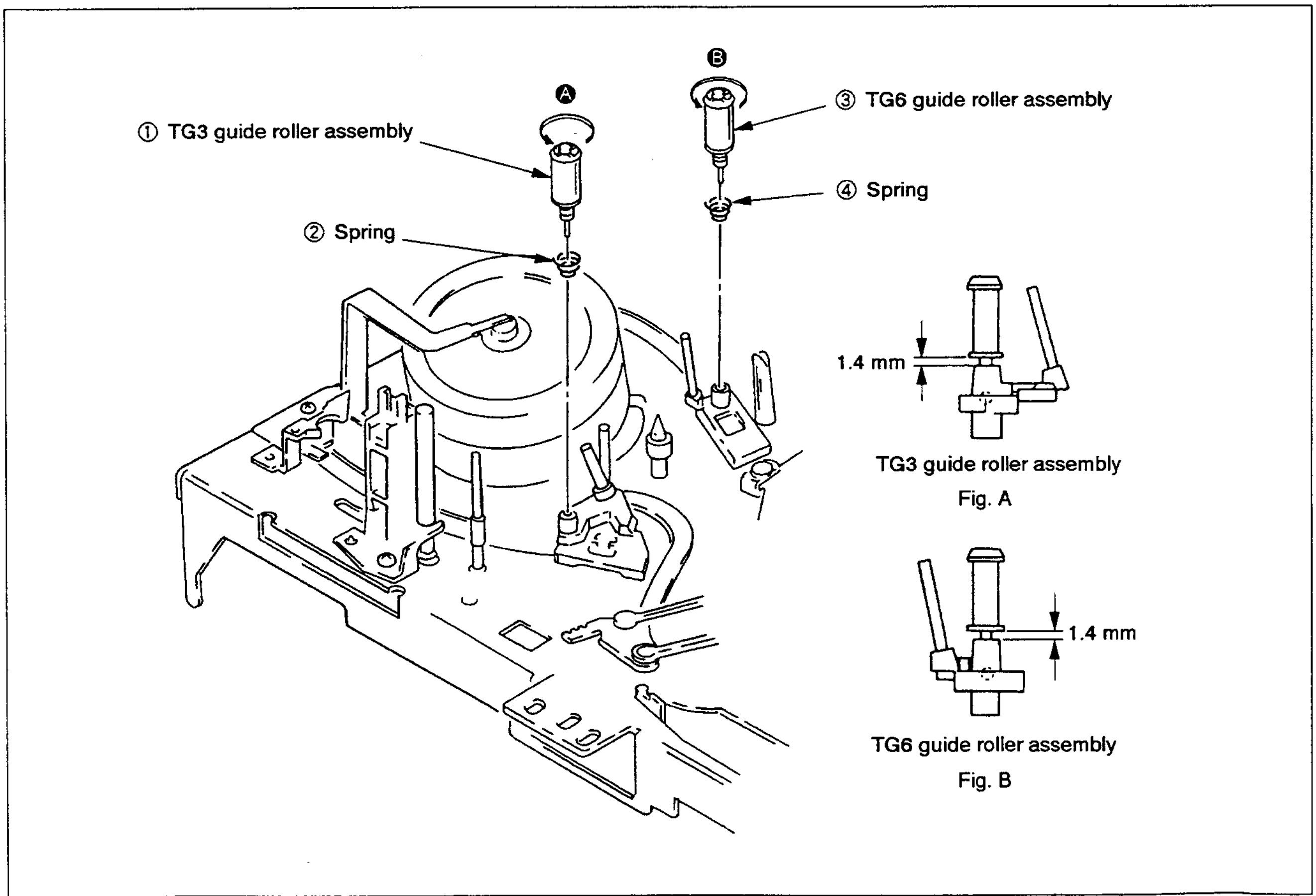

Ⓑ
Ⓐ
③ TG6 guide roller assembly
① TG3 guide roller assembly
④ Spring
② Spring
1.4 mm
TG3 guide roller assembly
Fig. A
1.4 mm
TG6 guide roller assembly
Fig. B

Fig. 3-8

2-4. TG8 ASSEMBLY (Refer to VHS Mechanical Adjustment Manual Ⅳ page 23)

- As the shape of TG8 assembly was changed, Section 3-13 is changed.

☛ : Chenged portion

3-13. TG8 ASSEMBLY (Fig. 3-15)

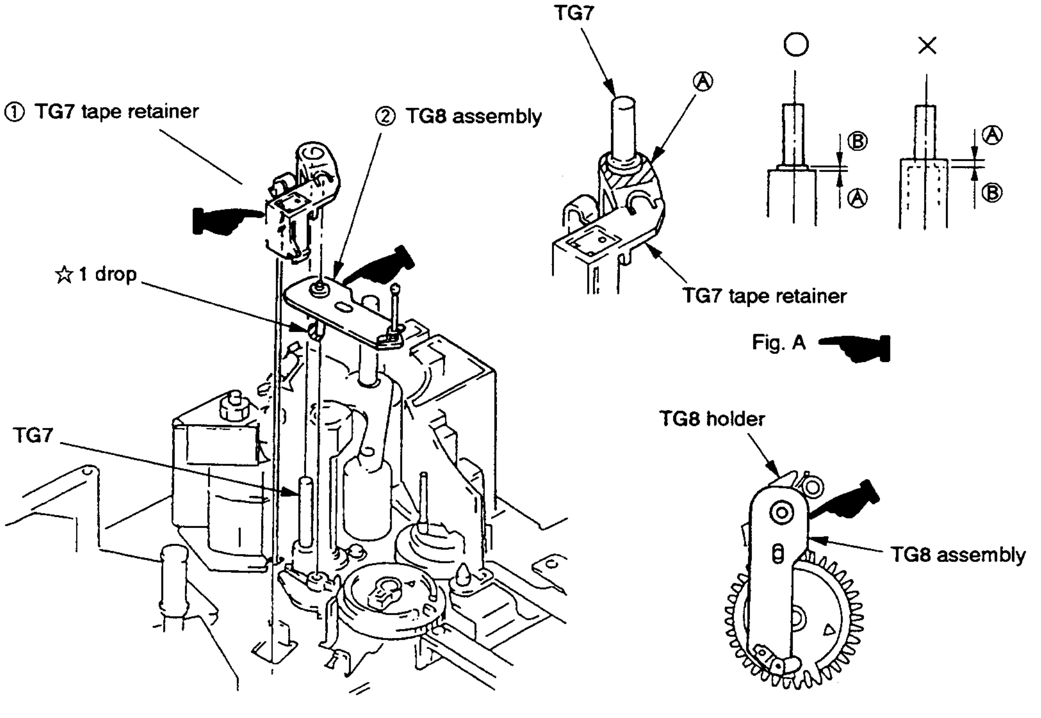
1) Remove TG7 tape retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG7 tape retainer ①.
- After attaching the TG7 tape retainer ①, check that side Ⓐ of ① is below side Ⓑ of the stepped-part of the TG7 shaft. (Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.



① TG7 tape retainer
② TG8 assembly
☆ 1 drop
TG7
TG7
Ⓐ
TG7 tape retainer
○
×
Ⓑ
Ⓐ
Ⓐ
Ⓑ
TG8 holder
TG8 assembly

Fig. A ☛

Fig. B

Fig. 3-15

2-5. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual IV page 35)

- As the tension regulator position and tension adjustment were changed, the tension adjustment and Fig. 4-1 are changed.

☛ : Changed portion

- **Tension adjustment**

Mode	Playback
Measuring instrument/tool	Torque cassette
Adjustment locations	Position for hooking the tension spring
Specified value	34 ± 4 g•cm ☛

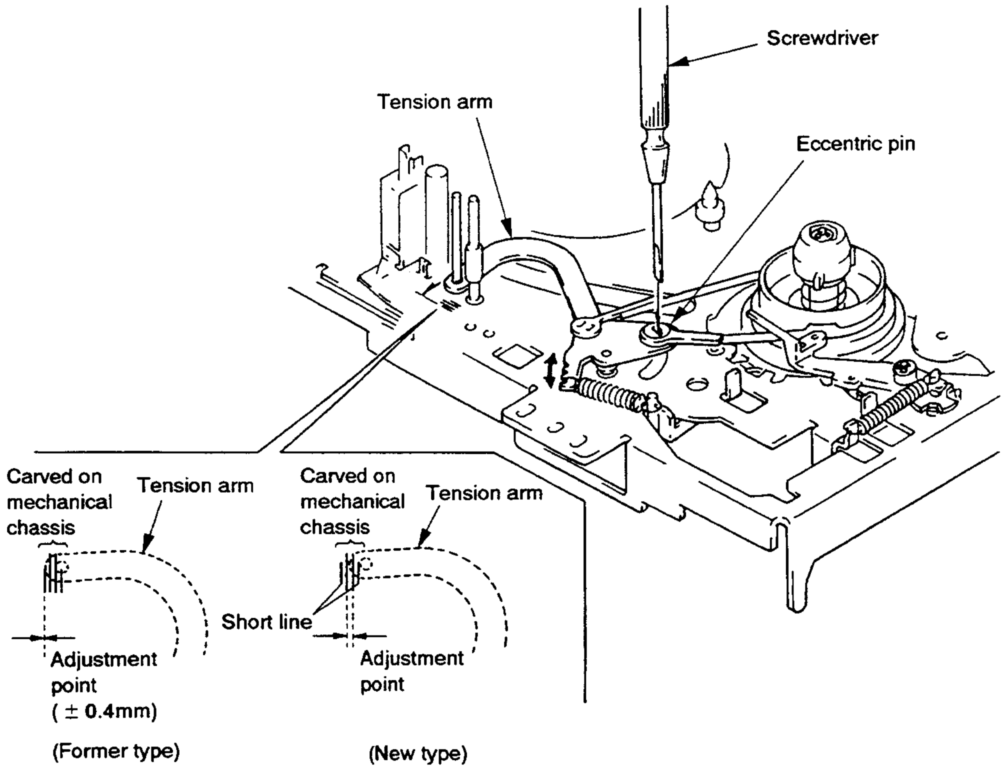

Screwdriver
Tension arm
Eccentric pin
Carved on mechanical chassis
Tension arm
Adjustment point
(± 0.4mm)
(Former type)
Carved on mechanical chassis
Tension arm
Short line
Adjustment point
(New type)

Fig. A ☛

Fig. 4-1

2-6. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual Ⅳ page 36)

- As the use of TG8 height adjusting screw was cancelled, section 4-1-2 is changed.

4-1-2. TG7 TAPE PATH ADJUSTMENT (Fig. 4-2)

[Adjustment Method]

1) Load a tape, and playback the tape in the CUE mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape (Fig. A).
2) Then, feeding the tape in the REV mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape.
3) If the tape height in the REV feed is higher that in the CUE playback (Fig. B), rotate the ACE head flapping adjust screw in the direction Ⓐ so that a difference in tape height between CUE mode and REV mode becomes zero.
4) If the tape height in the REV feed is lower that in the CUE playback (Fig. C), rotate the ACE head flapping adjust screw in the direction Ⓑ so that a difference in tape height between CUE mode and REV mode becomes zero.

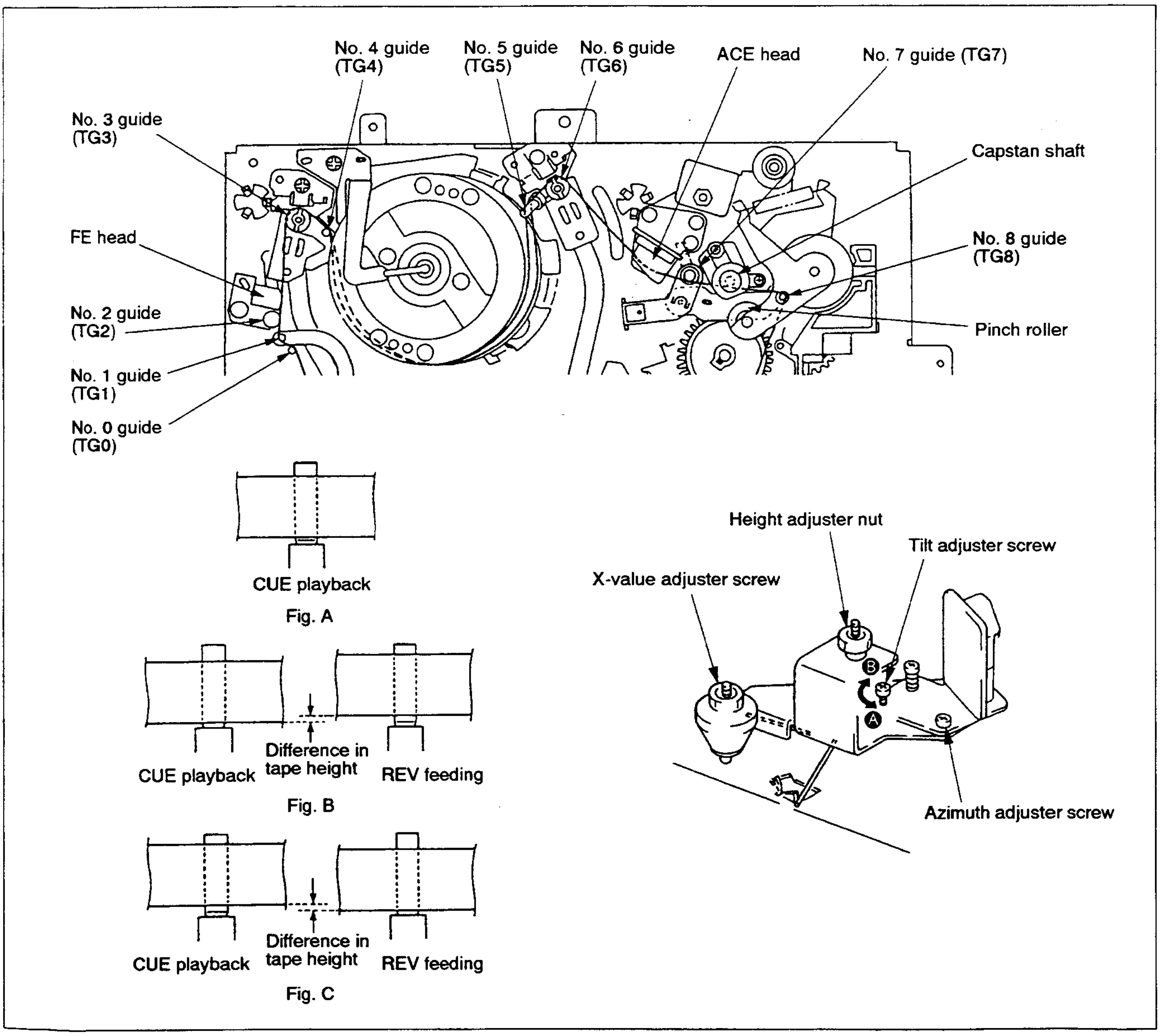

No. 4 guide (TG4)
No. 5 guide (TG5)
No. 6 guide (TG6)
ACE head
No. 7 guide (TG7)
No. 3 guide (TG3)
Capstan shaft
FE head
No. 8 guide (TG8)
No. 2 guide (TG2)
Pinch roller
No. 1 guide (TG1)
No. 0 guide (TG0)
CUE playback
Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
Ⓑ
Ⓐ
Difference in tape height
CUE playback
REV feeding
Azimuth adjuster screw
Difference in tape height
CUE playback
REV feeding

Fig. A

Fig. B

Fig. C

Fig. 4-2

English
95H05103-1
Printed in Japan

© 1995. 8

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

9-973-623-84

Published by Personal A&V Products Div.
Quality Engineering Dept.